COAL AGE

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The Spirit of 1917

"THIS morning I discovered for sure that war is now a reality," said a friend. "The day war was declared my oldest boy enlisted in the 7th, my second has just joined the navy, and my youngest has gone in the American ambulance service in France. I see no other way I can serve, so I guess I'll apply for a job as deputy sheriff." This man is a millionaire, and his is the spirit of 1917. It is the fervent patriotism of 1776 reincarnated.

What can I do? How can I help? These are the questions on the lips of each of us.

We no longer believe this war is to be a summer excursion. It is to be a real war. It is to be so prosecuted that no nation on earth will ever again make light of the powers, purposes and principles of the hundred million free Americans living under the Stars and Stripes.

We must move in such ponderous fashion that no government in the future will even think of entering into a conflict of arms with the United States.

We must so put our heart into this war that such terrible things in the future will be impossible. If we can banish such barbarism from the earth, the blood and treasure it must cost will not have been in vain.

The whole world knows now that we did not want to fight. But the whole world must know that this, the richest country on earth, loves liberty, not only for itself but for other people, more than it does its wealth. Let us show that no sacrifice is too great when our cause is just, and there will be no contemptuous sneering at "America's wooden sword" in the ages to come.

We must act with the caution of certainty, but with such promptness that no one can accuse us of a desire to mark time until the Allies win the war. We despise the man who hires another to fight his battles. A nation is just as despicable that buys a substitute to vindicate its honor.

Universal military training should have been applied more than a year ago. We can't remedy the error now, but we can demand that none of our representatives act to delay the Army Bill and add an hour's time to war preparations.

The volunteer system is unfair because it calls to arms the true patriot, leaving the slackers at home to enjoy the advantages of free government. It draws for service the sturdy, loyal, busy men of our great industries, many of whom could serve best by remaining where they are, and neglects the thousands of well-to-do idlers who thereby escape their share of national duty.

The volunteer plan for raising an army is undemocratic, inefficient and expensive. It shifts the burden to the few who are impelled by patriotism to make sacrifices. The selfish and unpatriotic rest at home in ease.

Even under the most favorable conditions, months will elapse before we can prepare a large army for service. Let each and everyone of us in the coal industry give 100 per cent. of all there is in us. Our first duty is to see that our Congressmen in Washington act with speed, or render account to us. Let the fellows in Congress know how the people at home feel. Write a letter to Washington today.

NEXT week on this page we want to discuss plans whereby the coal industry can contribute the greatest service to the country and its allies. Please send every suggestion you can to the editor of COAL AGE.

Ideas and Suggestions

Getting Ready for the Job Ahead

We hear and read a lot about opportunity. More likely than not we envy those who are more successful than we are, those who hold bigger and better-paying jobs, and say they are lucky or have a pull. We think opportunity is a mysterious and intangible something that knocks once and is gone forever before it can be grasped.

Many of us think there is no opportunity in the job we are holding down. It is too commonplace. Perhaps one is only a trapper, a trip-rider, a driver, or a clerk in the mine office. Even if he is a foreman or a superintendent, the job ahead looks far off.

Well, it is all wrong for him to think about the matter like this. The opportunity so longed for is in his daily job just as certain as the sun shines. In every man's job there is the germ and sprouting seed of another and better position.

The best thing about one's present job, no matter what it is, is the chance it gives him to get ready for the job ahead. It is there all the time. There is no better proof of it than the fact that he probably does business every day with the man ahead of him, who is going on up some day as sure as fate. Will the subordinate be ready to take the vacant place? How is he to get ready? Well, here is how one man got ready for the job ahead, and only recently he got it.

Several years ago this man was made storekeeper at a small mine away out in the woods. The place was so far from headquarters that no particular facilities were provided and mine spares of all sorts were kept in any fashion. The idea seemed to be that even the general office people never paid much attention to how things looked out there, so why bother? If a fellow was sent there to work, why he was, so to speak, buried. Somehow this young fellow didn't see it that way. He gathered up spares of all kinds and made lists of them, until he had a clear record of all the stores around his mine. By degrees he got the superintendent to improve his store building and got bins built in it. Every bin was tagged, and bolts as well as all other sorts of material were so stacked and arranged that anybody could see at a glance how many were on hand. The superintendent grew so proud of that storeroom and the way his storekeeper kept things that he would show it off as a kind of prize package whenever the manager visited the place. He, too, caught the spirit of opportunity that is hidden in every job. The thing spread all over that little plant.

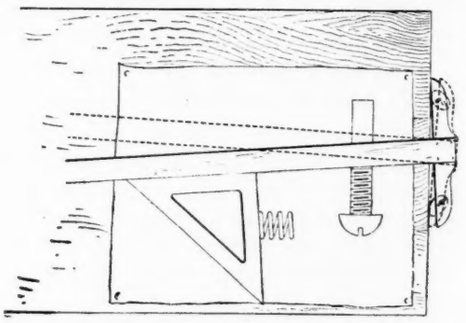
The storekeeper soon became head clerk in the office at that mine. Recently the manager went down and after a painful interview with the superintendent brought the former storekeeper to a real job in the general offices. I had to go down to check him out. The last thing before we left, he asked me to walk over to the storehouse for a moment with him. Without indicating in any way by manner or voice that he had really done it, he pointed to several hundred dollars worth of spare parts and said: "When I came here all that kind of material was on the ground outside, half buried in the mud—doesn't it look lots better in here?"

That man had the right idea of his job. He is going to make good on his new one.

Don't discount the opportunity there is in your job. Somebody is watching you to discover if you can fill the job ahead. It is in you to get it if you want it.

Attachment for Drawing Oblique Lines

On shop drawings requiring series of parallel lines at angles, as for threads, springs and section lining, I have found the device shown in the accompanying illustration of advantage. It consists of an eccentric made of sheet brass and is attached to the T-square head by means of



ATTACHMENT FOR T-SQUARE

a small thumb-screw. The eccentric may be turned to give a variety of angles, and with the aid of the triangle, vertical angles may be obtained. A hole is made at both ends of the T-square head, and the eccentric is transferable to either end.—H. Chait in *American Machinist*.

Waterproofing Leather Boots

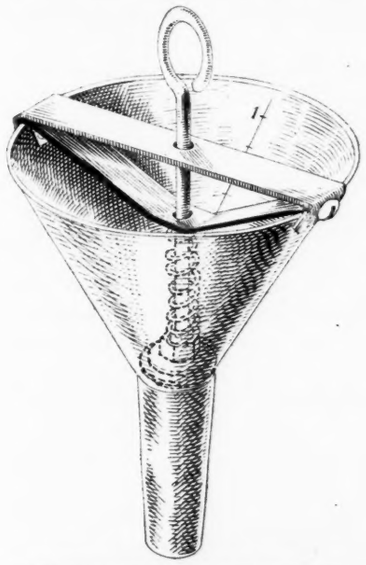
Treating leather boots to make them waterproof is a subject of much interest to engineers, miners and prospectors where snow, wet workings and rainy weather are to be contended with, says the *Engineering and Mining Journal*.

The time-honored method of rubbing mutton tallow on the boots and then standing them near the fire so that the tallow can melt in is good, but troublesome and nasty. There are several liquid preparations sold on the market, warranted to make leather waterproof. As a rule, however, these are expensive and do not do the work. Most of them, while making the leather soft and pliable and probably adding to its life, seem to allow the water to pass through the leather faster than when not used. Neat's-foot and castor oil, when freshly applied, are waterproofing, but the effect is short-lived. Any liquid to be thoroughly waterproofing and at the same time have a lasting effect must consist of a gummy base and a dissolving liquid. The latter makes it possible to spread the mixture and also carries the gummy ingredient into the leather.

A mixture that is waterproof can be prepared by melting rubber into a pan of boiling grease. The rubber from old rubber boots will do; it should be burned over the grease and the molten matter allowed to fall into the pan. Another mixture just as good can be made by substituting the gum from any of the evergreen trees for the grease in the mixture just described. Either of these preparations is decidedly disagreeable to make, but when applied hot to leather boots will positively make them waterproof.

Combined Oil Measure and Funnel

The combination shown in the illustration serves as a measure and a funnel as well. The marks for different quantities of course are found by once pouring in different measured amounts and marking the scale accordingly, says L. V. Lauther in a recent issue of *Power*.



STOPPER IN BASE OF FUNNEL

The spring holds the stopper down to prevent the oil from flowing out. The construction may be simplified by using only the upper guide and a tight-fitting cork on the end of the rod.

Our Fellow Workmen

The quotation, "If you want to have a friend be one," should hold out a particularly strong appeal to every man in the coal-mining industry. Our calling, in this country at least, attracts to itself men whom we are pleased, with a sort of supercilious aloofness, to term "foreigners."

These men go down into the mines daily, work hard, and confront many dangers in order to make a living. Yet, when it comes right down to brass tacks, we refuse to permit them to enter into our every-day sports and conversations. We seldom recognize them when we see them; if we do, it is with a sharp remark. We laugh at the way in which they talk the English language, yet they are working hard to master it.

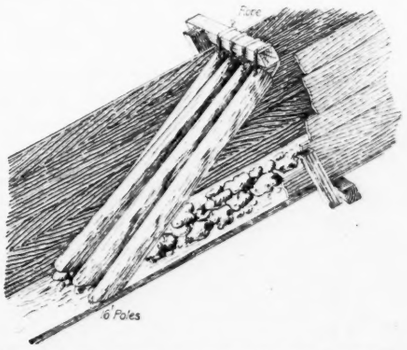
It is because of this kind of treatment that so many of them leave their jobs. But the time is drawing near when the scarcity of foreign labor will cause a slump in the coal fields—it is gradually decreasing at the present time. The coal companies strive for big tonnage, yet they never think of the treatment accorded the miners who produce the large output.

We should act differently toward these men. When we go into their rooms or places we should not merely confine ourselves to a "Hello Joe," and "Goodbye." We should converse with them; ask them about their family, if they are married; if they are not, ask them of some happening in their native country. This creates more hearty coöperation, and produces better results.

The reason that many of these men get drunk and cause trouble is largely because they have no other way of spending their time. Let them join in all activities and sports. This will show them that they are not being discriminated against, and create a feeling of true fellowship. Imagine yourself situated as they are, under their conditions, and you will realize that there is no better policy than treating your fellow workmen in the mines in a fitting way.

Pole Buffer in Coal Chute

In the accompanying illustration is shown a device for retarding coal or rock rolling down a steeply inclined chute. A number of poles, 8 to 10 in. in diameter, are suspended in parallel groups from the tie-pieces of the chute, as shown, the lower ends resting on the bottom of the chute. The number of poles and the distance between the groups vary according to the steepness of the



REDUCING SPEED OF COAL IN CHUTE BY POLE BUFFERS

chute and the size of the coal. Ordinarily, one pole to each foot in width of chute will suffice. If the coal is coarse and dry, the groups of poles will have to be so spaced that the lower ends of one group will be about vertically under the upper ends of the next lower group. For finer coal, or material that is wet or sticky, a wider spacing will be sufficient. If the coal changes from a free-rolling to a slower-moving material, it is a simple matter to elevate the lower ends of one or two poles of each group by tying them to the next lower chute-tie, thus permitting a less interrupted passage.—*Engineering and Mining Journal.*

Many Commercial and Municipal Specifications exact penalties for a slight increase in the sulphur content, although coal of high sulphur content may clinker less and its heating value may be higher. One specification received by the Bureau of Mines exacts a deduction of 5 per cent. in price for each 1 per cent. of sulphur in excess of the standard. In the case of a coal supplied at $3 a ton, the presence of 1 per cent. of sulphur in excess of the standard, as indicated by analysis, would often result in an unwarranted deduction of 15c. a ton. Under such a contract, the variations which it is recognized exist in sampling and analysis may cause a contractor unjustly to suffer a heavy deduction.

Yampa Coal Field in Colorado

By F. W. Whiteside*

SYNOPSIS—Description of a coal field that promises to be one of the most successful in the state. Development progressing rapidly. Particularly difficult transportation problems have proved a serious handicap.

A district of Colorado that is rapidly forging to the front in the production of coal is located in the northwestern portion of the state, in the eastern part of Routt County, 200 miles by rail from Denver.

While coal mining of sufficient magnitude to care for the immediate needs of the residents of this locality has been carried on for many years, it was only after the Denver & Salt Lake R.R. was completed to Hayden, Craig and Steamboat Springs that mining on a commercial scale actually began in earnest. Since that time one mine after another has sprung into existence, until the number of producers now totals fifteen. From these few properties 919,509 tons of coal were mined in 1916, or 8.74 per cent. of the entire production of the state, an increase of 73,050 tons over the output of the previous year.

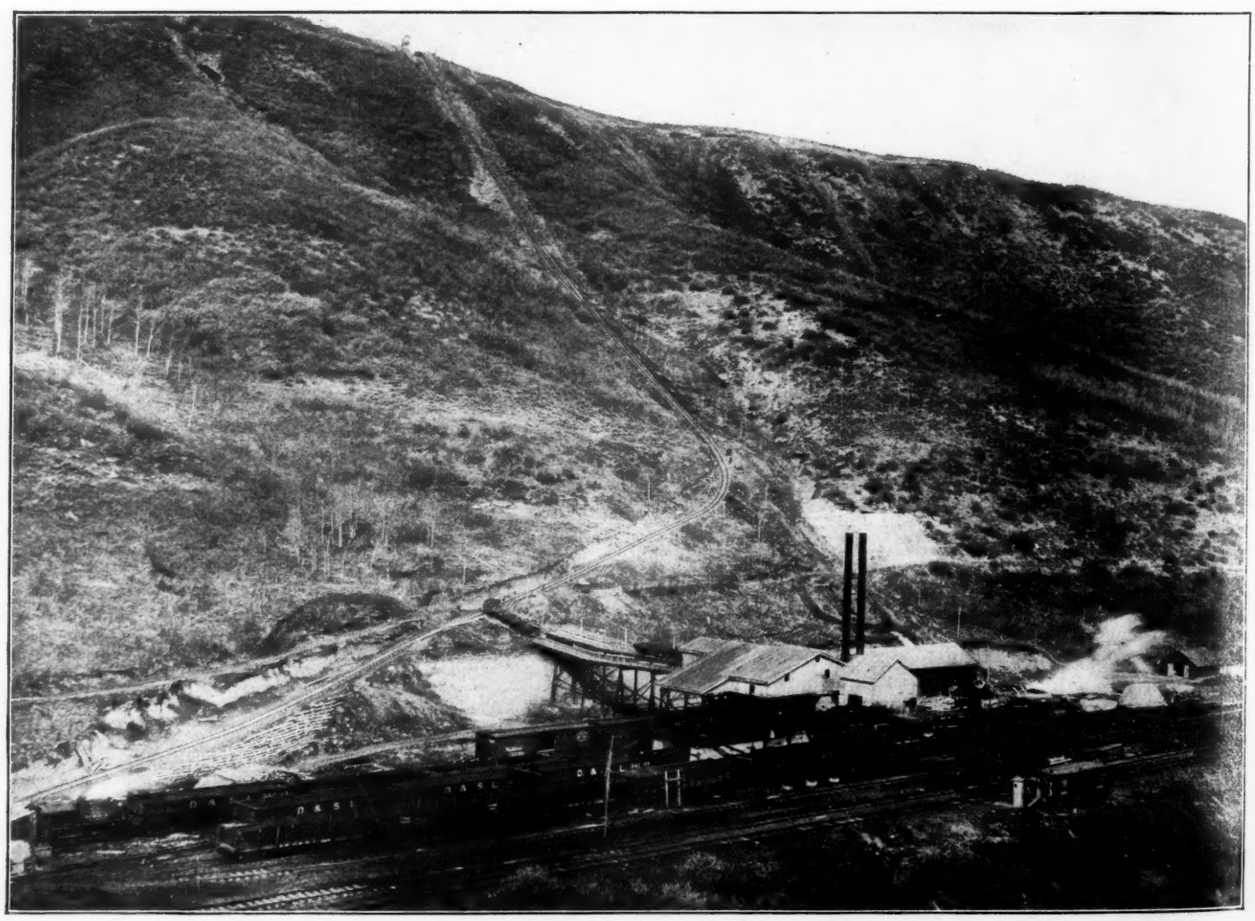
The more valuable coal beds are located in and about the valley of the Yampa (the Indian word for bear) River, from which stream the field takes it name. The main portion of the deposit is roughly triangular in shape, the vertices lying approximately at Lay, Sand Mountain and Yampa respectively. Steamboat Springs being about 10 miles without the field, is the largest nearby town of importance.

*Chief engineer, The Victor-American Fuel Co., Denver, Colo.

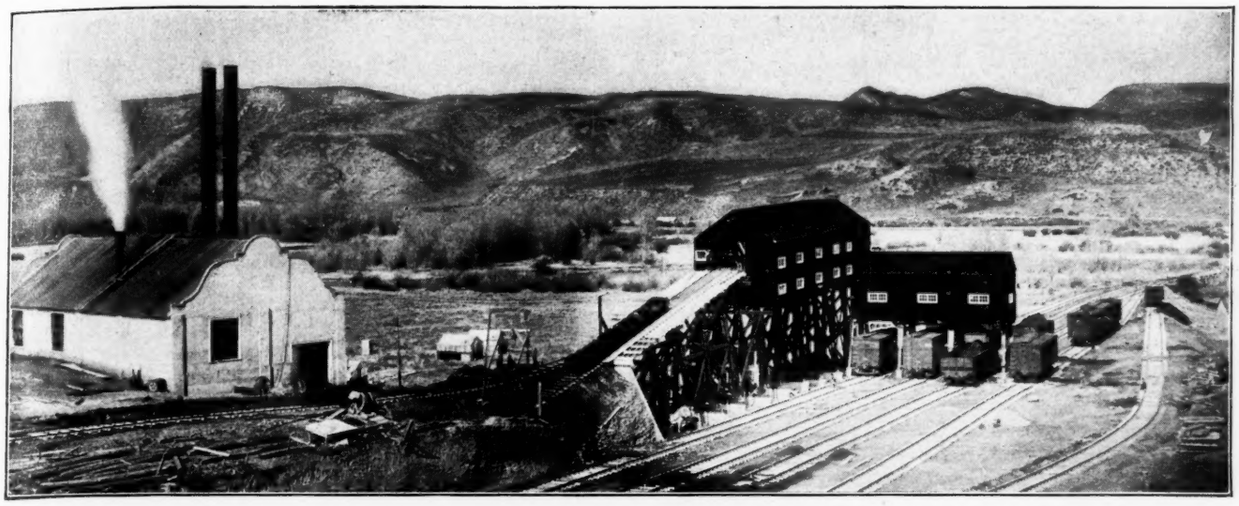
Geology of the District

Axial Basin, so named by Dr. C. A. White of the Hayden survey, occupies a great anticlinal axis, thought to be the eastward extension of the Uinta Mountain uplift. This anticline forms the dividing line between the Yampa field to the north and the Grand River coal deposits to the South, all believed to have been once a continuous field.

The majority of the coal-bearing measures of Colorado lie in the Upper Cretaceous, the most valuable coal deposits being found in the Montana and Laramie formations. A quite general impression has prevailed that the Rocky Mountain coals all lie entirely within the Laramie formation, which is approximately 1000 ft. in thickness. More careful and detailed research has disclosed the existence of coal deposits considerably older than the Laramie. The Mesa Verde (green table land) formation of the Montana group, lying under the 1000 to 2000 ft. of Lewis shale which separates it from the Laramie, offers the best coals of the Yampa field. The Mesa Verde is



HAYDEN BROS. PLANT IN THE YAMPA FIELD; NOTE ARRANGEMENT OF SHAKER SCREEN



McGREGOR TIPPLE, WHICH IS EQUIPPED WITH A ROTARY DUMP CAPABLE OF HANDLING A FULL TRIP

from 2500 to 3500 ft. in thickness and is identified by certain fossils of distinct and essentially marine types, while the Laramie is recognized by the fresh, or brackish, water fossils.

The coal seams of the Mesa Verde occur in three groups. Those of the lower group are found among the upper massive sandstones and the lower of the weak overlying sandstones and shales. About midway between the lower and middle groups lies the Trout Creek sandstone. This rock formation is white, very massive, and is plainly exposed and defined, being often 100 ft., or more, in thickness.

In the next 400 or 500 ft. above occurs the middle coal group, containing several exceptionally good workable seams, the best of which measures 8 to 12 ft. in thickness.

Closely underlying the base of the bottom seam of the upper group is the Twenty Mile sandstone, a massive deposit of great thickness, usually in a single bed, although in places it is composed of single layers aggregating several hundred feet. Like the Trout Creek deposit, it is very white and can easily be traced for many miles, being very conspicuous in Twenty Mile Park, from which it takes its name.

While the lowest coal seam of this group is immediately above the Twenty Mile sandstone, the thickest and most valuable seams are found several hundred feet higher.

The Lewis shales, separating the upper group of the Mesa Verde and the lower Laramie formation, are believed to be the same as those found at Fort Lewis in the La Plata valley in southwestern Colorado. In the Laramie are also found immense sandstone deposits similar in appearance to the Trout Creek and Twenty Mile formations, and these contain some valuable seams of sub-bituminous coal. Like other coal fields in Colorado, the Yampa deposits have been influenced to a considerable extent by igneous agencies, thought by many to represent two different irruptive periods, both subsequent to the Cretaceous, in which these coals were formed. Huge dikes and sills are to be found throughout this region, and it is to the influence of the latter that the anthracization of large areas of coal is due. These igneous intrusions are basaltic in character. The second type of irruptive rock is decidedly acidic, and by some is classed with the eruption which formed Hahns Peak, Elk Mountain and others. These eruptive rocks apparently bear no relation to the anthracization of the coal, as they formed in domes and not in intrusions, which followed breaks or crevices in the rocks.

The Coal

The general character of the Cretaceous coals of the Rocky Mountain region is sub-bituminous, although the conditions brought about by folding, pressure and igneous influences have changed them in many localities to higher grades of bituminous and anthracite coals. On account of these agencies the Yampa, or Routt County, field contains almost all known varieties of coals.

In Bulletin 297 of the United States Geological Survey, the authors, N. M. Fenneman and Hoyt S. Gale, divide the Yampa field into four main structural divisions as follows: (1) Twenty Mile Basin, (2) Williams Fork Mountains, (3) Wolf Creek District and Anthracite Range, and (4) Elkhead and Quaker Mountain District.

Yampa coal field, Routt County, 800,000 acres of high-grade workable coal deposits	Twenty Mile Basin	Twenty Mile Park District
		Dunkley Canyon District
		Oak Creek District
		Front Canyon District
		Eddy District
		Pool District
	Williams Fork Mountains	Sage Creek Canyon District
		Dry Creek District
		Hayden Gulch
		Other Gulches north of Williams Fork
		Hamilton District
		Deer Creek District
		Yampa Valley below Craig
		Yampa Valley near Craig
		Lay District
	Wolf Creek District and Anthracite Range	Yampa Canyon and Wolf Creek Districts, Anthracite Range
	Elkhead and Quaker Mountain District	Hayden Openings
		California Park
		"The Potholes" on Elk Creek
		Quaker Mountain
		Mouth of Elkhead Creek
		Fortification Creek

It is manifestly impossible in an article of this length to discuss each of the foregoing districts in detail. Therefore, each main division will be touched on only in a general way.

The Twenty Mile Basin and Williams Fork Mountain Districts

In the Twenty Mile Basin all the strata have a general dip from all sides toward Twenty Mile Park, the center. The Lewis shale forms the surface of the territory and all

A SAMPLE OF THE COSTLY RAILROAD CONSTRUCTION

coal measures being below, it follows that these seams are all of Mesa Verde formation.

The Oak Creek district being contiguous to the Denver & Salt Lake R.R., besides having some of the best grades of coal found in Routt County, is the heaviest producer. As these coals are of exceptional quality and occur in seams as high as 12 and 14 ft. thick, a large market has been found for their sale. Coals in the upper, middle and lower groups are all found in the district. In fact, it is fair to suppose that drilling will prove the existence of all three groups throughout the Twenty Mile Basin.

The most important development has been carried on in and about the towns of Lay and Craig, the latter being the present terminus of the Denver & Salt Lake R.R. There are also a large number of country banks, which supply the needs of the farmers and ranchers living nearby. All three groups of the Mesa Verde are found, each having workable seams, measuring as much as 12 ft. in thickness. Comparatively little coal is shipped by railroad from this division, nearly the entire output being used locally. This subdivision comprises a strip along the eastern outcrop line, from 3 to 10 miles in width and extending north and south for a distance of probably 33 miles. The coal-bearing rocks dip to the west on a grade of approximately 16 per cent. The greatest activity is in and about the junction of Wolf Creek with the Yampa River, where several producing mines are located, two being upon an 8-ft. seam of clean coal and the third upon a 20-ft. seam located stratigraphically 70 ft. below. The latter seam has one 15-in. sandstone parting and probably two or three additional ones of shale which are of minor importance. These are probably of the middle group. Seven hundred feet below the 20-ft. seam occurs another, on the outcrop of which several properties are located. These are thought to belong to the lower group.

The upper group coals outcrop in a line roughly north and south, which crosses the Yampa River about a half mile east of Dawson station upon the Denver & Salt Lake R.R. No producing mines are located upon the upper series.

The northern border of the field has witnessed great igneous disturbances which have anthracized large areas of coal. As the extent of anthracization depends upon the proximity of the molten rock to the coal seams, there are numerous instances where the same seam changes from bituminous to anthracite in a few feet.

The seams of the middle groups have been prospected to a greater extent than those of either of the others. It is even possible that the middle group is the only measure which has been anthracized. The best seams of anthracite so far prospected measure from 28 in. to 11 ft. in thickness.

On account of transportation difficulties, the deposits being twelve or more miles on an air line from the railroad, no anthracite is shipped out of the county. Numerous railroad surveys have been made into the field, however, so that shipment of anthracite coal from these deposits may soon begin.

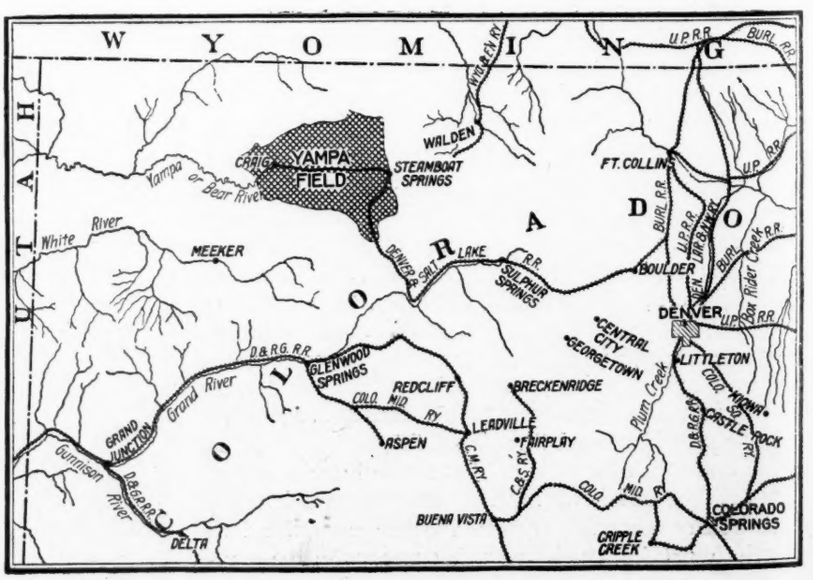
The area covered by the anthracite field is rather indeterminate and is variously estimated at from 6400 to 16,000 acres, much of which may contain three or more workable seams.

Elkhead and Quaker Mountain District

The town of Hayden is the largest settlement in this division. Near this place a number of seams of the Laramie have been developed to a limited extent. These show lustrous, black coals containing higher percentages of moisture than the lower beds, and are therefore more subbituminous in character.

In California Park the Laramie coals are again to be found, and at least six good workable seams of clean coal are exposed.

In "the Potholes," a local name for a small park on Elk Creek, several lava sills have baked the coal, forming



MAP SHOWING LOCATION OF THE YAMPA COAL FIELD

A TYPICAL HAULAGE SYSTEM

SOME OF THE DIFFICULTIES IN RAILROADING IN THIS FIELD

several seams of black, lustrous anthracite. This unfortunately is badly broken up by faults and steps, so that its future value as a producing field is problematical. These seams are in the Laramie.

On Little Bear Creek, a tributary of Fortification Creek, the Seymour mine has developed a small country bank in which 17 ft. of bright, clean, sub-bituminous coal of the Laramie is worked for local consumption.

There is reason to believe that the Mesa Verde coal groups underlie this entire division, but as prospecting with diamond drill has not been carried on to any extent their actual presence must still remain a secret.

The proximate analyses given in Table I were made by F. M. Stanton, of the United States Geological Survey, and are typical of the values of the district from which the samples were obtained.

TABLE I. APPROXIMATE ANALYSES OF THE COALS FROM THE YAMPA FIELD

		Analyses of Samples as Received					Analyses of Air-Dried Samples				
		Moisture	Volatile Combustible	Fixed Carbon	Ash	Sulphur	Loss on Air Drying	Moisture	Volatile Combustible	Fixed Carbon	Ash	Sulphur
Twenty Mile Basin		8.85	36.06	50.19	4.90	1.51	2.30	6.70	36.91	51.37	5.02	1.54
Williams Fork Mountains		12.50	35.15	46.91	5.44	0.42	6.20	6.72	37.47	50.01	5.80	0.45
		11.03	35.85	47.46	5.66	0.52	2.70	8.56	36.84	48.78	5.82	0.53
		11.34	34.49	49.51	4.60	0.50	3.40	8.22	35.70	51.32	4.76	0.51
Wolf Creek District	(A)	10.59	36.75	47.53	5.13	0.44	4.00	6.87	38.28	49.51	5.34	0.46
Anthracite Range	(B)	6.85	23.84	60.00	9.31	0.55	4.20	2.77	24.88	62.63	9.72	0.58
	(C)	6.94	3.42	75.61	14.03	0.57	4.20	2.86	3.57	78.92	14.65	0.59
Elkhead and Quaker Mountain District	(C)	6.68	6.14	76.01	11.22	0.65	4.10	2.64	6.40	79.26	11.70	0.68
	(C)	17.08	35.30	41.97	5.65	0.46	8.50	8.88	38.58	45.87	6.17	0.50
	(C)	10.07	37.26	48.37	4.30	0.95	5.00	5.34	39.22	50.91	4.53	1.00

(A) Sub-bituminous. (B) Anthracite, both from different localities on same seam. (C) Not obtained by Mr. Stanton; quantities derived from other analyses.

Of the many problems which vex the operator in the Yampa field, that of transportation is probably the most difficult to solve. The winters are long and very cold. The snow often lies several feet deep on a level for the entire winter season. The Denver & Salt Lake R.R. is the only line operating into Routt County, and the service is greatly hampered by the 29 miles of 4 per cent. grade over the Continental Divide, which serves as a temporary line until the six-mile tunnel is driven under the range.

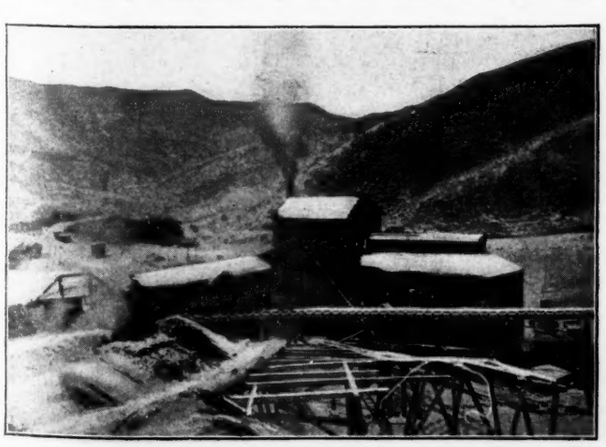
At Corona, "the top o' the world," the line reaches an altitude of 11,660 ft. above sea level. Here is a region of perpetual snow. In the winter season extremely high winds prevail, which drift the snow into the railroad cuts immediately after the rotary plows have forced their way through. The difficulty of keeping the road open, added to extremely low temperatures and heavy grades, makes the operation of both freight and passenger trains not only uncertain but very expensive.

Great credit is due the officials and employees of the railroad for their heroic efforts to keep trains in motion, but there are some undertakings outside the realm of human performance, and operating a railroad on schedule over the crest of the Divide is one of them. As soon as the excavation of the tunnel can be financed and completed, transportation facilities in the Yampa field will be considerably improved.

A very excellent market for the coals of the district is found in Denver, Kansas, Nebraska and eastern Colorado. So great has been the demand, it has been impossible to supply the markets during the past winter season.

As previously stated, all grades of coal from lignite to anthracite are available in this field. The Denver Basin, however, on account of its more favorable location to local and eastern markets, enjoys a monopoly of the lignite business; hence the Routt County field divides honors with the Cañon City and Walsenburg districts in supplying bituminous and sub-bituminous coals.

The coal of certain of the mines has a decided tendency to coke in a firebox, but so far as I know, none of it will make a successful commercial coke. This must still be obtained from the Trinidad and Raton fields.



PINNACLE MINE TIPPLE AND BINS

The Fuels of Texas

By A. C. Scott*

SYNOPSIS—Available fuels in Texas comprise wood, coal, lignite, oil, and natural gas. The gas and oil supply is necessarily indeterminate. The known quantity of lignite is large and its economic utilization would do much toward the development of the state industrially.

The commercial development of the fuel areas of Texas began about 20 years ago, and the output and consumption has steadily increased during the intervening period; nevertheless, the vast producing fields are still practically unaffected in the amount of fuel available.

The natural fuels of Texas comprise wood, coal, lignite, petroleum and natural gas.

The amount and value of firewood used in 1908 in Texas is given in Forest Service Circular No. 181, and shows amounts as follows:

	Quantity, Cords	Value
Used on farms	2,518,360	$6,549,939
Cities and towns from 1,000 to 30,000 population	1,351,360	5,310,845
Cities over 30,000 population	179,333	923,015
Mineral operations	55,933	176,507
Total	4,104,986	$12,960,306

These figures indicate an average value per cord of $3.16.

In total consumption of firewood, Texas ranks sixth among the states, North Carolina being first. In total value, Texas is second, being exceeded only by Michigan.

The heat value of well-seasoned wood varies from 7,500 to 9,000 B.t.u. per lb., depending upon the kind of wood. It is commonly stated that 1 lb. of high-grade soft coal is equivalent to 2½ lb. of air-dried wood, and while this statement appears to favor the soft coal, it is also to be noted that in most cases the boiler furnace efficiency will be higher with coal than with wood, and thus the available heat will be greater.

Ordinary well-seasoned wood may still contain as much as 25 per cent. of water, which may not be entirely removed below 250 deg. F.

The ash varies from 0.1 per cent. to 8 per cent., but commonly does not exceed 2 per cent. of its weight, and consists of lime, magnesia, potash, soda, oxides of iron, manganese and aluminum as bases, combined with acids to form carbonates, sulphates, silicates, phosphates and chlorides.

It is authoritatively stated that the significant coal area in Texas is 8,200 sq.mi., with an additional area of 5,300 sq.mi. that may possess workable seams. This area is chiefly included within the counties of Eastland, Erath, Maverick, Palo Pinto, Webb, Wise and Young, and during the past 20 years the quantity mined has been something over 15,000,000 tons, worth an approximate average value of $2.25 per ton. When it is considered, however, that the estimated amount of the total supply is eight billion tons, it will be noted that only about one five-hundredth part of the supply has been mined; at the same average rate of output, the supply is available for nearly 1,000 years.

The three recognized coal fields of the state include one in north central Texas and two on the Rio Grande River. The quality is semibituminous, and the coal occurs for the most part in comparatively thin seams, 2 ft. thick and under. The greater part of the output is used for railroad purposes, although some is consumed in industrial power plants.

Tests made on samples of coals from all three of the recognized coal fields do not show a great difference in quality of the fuel, the moisture content being from 3 to 5 per cent., and the calorific value from 12,350 to 13,360 B.t.u. on the wet basis, and 12,810 to 13,900 B.t.u. on the dry basis. The volatile matter ranges from 29.5 per cent. to 42.9 per cent.; fixed carbon, 45 per cent. to 61 per cent.; ash, 5.4 to 7.6 per cent.; with sulphur variable in amount up to about 2 per cent.

Lignite Fields Are Extensive

There is probably no other single fuel field anywhere in the United States that covers so large an area as that included in the lignite belt of Texas, which extends in a strip from 50 to 100 mi. in width from the Louisiana boundary to the Rio Grande River, at a distance of from 75 to 150 mi. from the Gulf Coast, and nearly parallel with it. This occupies an area of about 60,000 sq.mi., or nearly one-half the entire known lignite area of the country.

The original supply of lignite has been authoritatively estimated at thirty billion tons; the total output during the past 20 years amounts to about ten million tons, or only an insignificant one three-thousandth part of the total quantity available.

The value of lignite at the mine is more or less variable, but averages in the neighborhood of $1 per ton.

Lignite is an intermediate fuel between peat, on the one hand, and soft coal, on the other, and occurs in decidedly lenticular deposits, some of which at points of greatest depth of vein are 14 ft. or more in thickness. The majority of lignite mines, however, have veins from 4 to 7 or 8 ft. in thickness, and the depth of the deposit varies from surface outcrop in some localities to something over 100 ft. in others. In a number of places there are evidences of second and third workable beds, but up to this time few if any have been penetrated for mining purposes.

Lignite as mined contains on the average about 28.5 per cent. moisture, with a possible saturation value of from 31 to 39 per cent. There is commonly some loss in moisture during transportation from the mines to the steam plants where it is chiefly used, and the calorific value as fired under boilers, or in gas producers, approximates 7,500 to 8,000 B.t.u. per lb.

The most productive lignite mines are located in Bastrop, Fayette, Henderson, Hopkins, Houston, Lee, Leon, Medina, Milam, Robertson, Titus and Wood counties, the latter county having mines at Hoyt and Alba, whose normal daily production is 1,000 to 1,500 tons.

The greater part of the lignite output is used under steam boilers in the various industrial plants of the state, and while lignite is classed as a low-grade fuel, it is the most economical for the small or medium size power plants at the present time where the railroad haul is

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short enough to add not more than 50 or 75c. per ton to the mine cost of approximately $1. The freight and handling costs are in most cases so large compared with the mine cost that any improvements in apparatus to reduce the amount burned to produce a required amount of power is an important and direct economy.

The following table shows results of analyses of samples from twenty-three different lignite mines in Texas:

	Per Cent. From	Per Cent. To	Average per Cent.
Moisture	7.30	37.26	25.17
Volatile combustible matter	20.33	45.62	37.59
Fixed carbon	21.09	38.92	28.45
Ash	4.81	16.11	8.79
Sulphur	0.41	0.96	0.65
Carbon	36.16	58.78	44.08

During the last few years the gas producer has been placed in successful service with Texas lignite as fuel. The producer gas thus generated is mostly used for power in gas engines designed for operation with gas averaging about 120 B.t.u. per cu.ft. The gas is employed for burning lime and might also be used for burning brick or tile. The use of lignite in the producer to furnish gas for industrial power, effects a considerable economy over the steam boiler plant operating noncondensing.

There are now about 25 power plants operating with lignite gas-producer equipment, using about 200 tons of fuel per day, and having a total rated capacity of approximately 12,000 hp.

Tests which I have made upon a 600-hp. producer-gas engine installation, using an average grade of lignite in Smith producers, showed an average development of power of 545 kw.-hr., per ton of lignite.

The composition of lignite producer gas is necessarily and obviously more or less variable in character, but as a general indication of percentage of constituents only, the following analysis by volume is significant:

VOLUMETRIC ANALYSIS OF PRODUCER GAS

	Per Cent. From	Per Cent. To	Average per Cent.
Carbon dioxide	8.2	11.8	10.3
Carbon monoxide	8.2	17.6	12.6
Methane	2.8	7.6	4.8
Ethylene	0.1	0.8	0.4
Hydrogen	3.6	12.8	8.7
Oxygen	...	1.0	0.5
Nitrogen	55.6	69.2	62.4
Heat units (B.t.u. per cu.ft.)	116	138	127.1

The volatile substances distilled from lignite yield a good gas for heating and illumination, as well as valuable byproducts including light oils, tar, pitch and ammonia.

It appears decidedly possible from an engineering standpoint to locate large central power plants in productive lignite territory and operate them by means of producer-gas engines, to furnish such electric energy as may readily be marketable, and to produce for commercial purposes the byproducts referred to, whose value alone would be at least three to four times the cost of mining the lignite. It has been stated on good authority that some Texas lignites yield nearly 10,000 cu.ft. of gas per ton of dry material, and it further appears from the analysis of this gas obtained by special distillation (not producer gas) that the manufacture of gasoline therefrom is worthy of consideration as a profitable financial possibility. The composition of the gas distilled from lignite is given as follows:

	Per Cent.
Illuminants	1.8
Carbon monoxide	9.8
Hydrogen	56.2
Methane	24.4
Nitrogen	7.8

The heat value of this gas has been shown to be 496 B.t.u. per cu.ft.

I am at a loss to understand why Texas capitalists do not devote some attention to the possibilities of the consumption of lignite along these lines, in lieu of confining the value of this fuel to the comparatively narrow and unimportant operation of mining only. At present the average freight haulage charge per ton is nearly as much as the cost to mine a ton of the fuel.

Petroleum and Its Uses

The third class of fuels to be considered is Texas petroleum, or crude oil. The organic theory of the origin of crude oil assumes that it results from the fractional distillation of animal and vegetable matter under heat and pressure. The current belief is that oil with a paraffine base results from the distillation of vegetable matter, while that with an asphalt base comes from the distillation of animal matter.

Whether or not this theory be true, it appears certain that the asphalt base is a polymerized paraffine, having the same percentage composition as paraffine but a different molecular weight, and altogether different physical and chemical properties, as is well known. One of the chief distinguishing characteristics of pure asphalt is its conchoidal fracture, when it is cold enough to be brittle. Oils having an asphalt base are unsuited to the manufacture of high-grade cylinder-lubricating oils unless changed by the introduction of paraffine to replace the asphalt.

When, as sometimes occurs, intermediate oils contain a small fraction of the asphaltic constituent, which is nonvolatilizable at a red heat, the successful and economical operation of low-compression oil engines, with such oils as fuel, becomes a serious matter. In high-compression oil engines of the Diesel type, an asphalt base oil, as fuel, appears to be as satisfactory as one with a paraffine base. The difference in base characteristics is also unnoticeable in connection with fuel oil for boiler furnaces.

The crude oil producing fields in Texas include two main localities, designated as Coastal Texas and North Texas. The Coastal Texas field includes Hardin, Jefferson, Harris, Liberty and Matagorda counties; and the North Texas field, Navarro, Wichita, Clay and Marion counties.

During the period from 1900 to the present time, the total output of crude oil accounted for has been approximately 200 million barrels. Up to 1913 the Coastal field produced about seven times as much as the North Texas field, but since that time the North Texas field has exceeded the production of the Coastal region. It appears that an average value of this crude oil over the period of production has approximated 50c. per bbl., the values actually ranging from 10c. on the first Lucas well, to over $1 per bbl. in the course of productivity in the fields in general.

Test results on typical fuel oils, from these fields, as made by the writer, are given in the following table:

ANALYSIS OF TEXAS FUEL OILS

Specific Gravity	Barometer, In. Mercury	Flashpoint, Deg. F.	Per Cent. Fixed Carbon	Heat Value, B.t.u. per Lb.
0.8386	28.84	38	1.54	19,320
0.9172	29.27	142	3.23	18,698
0.9231	29.29	126	2.81	19,490
0.9256	29.28	85	1.64	18,790

The specific gravity was taken with a Westphal balance, the flash point was determined in an open vessel, the

heat units per pound were obtained with a Parr calorimeter and the carbon residue by heating a carefully weighed sample to a bright red heat and then weighing the cooled residue. The characteristics of crude oil vary greatly with different specimens. The odor may vary from pleasant to very disagreeable and the color from almost transparent to black. The range in specific gravity is also considerable. The specific gravity is not a dependable index to the thermal content, or heat value of the oil.

Natural Gas

The commercial exploitation of natural gas in Texas began about six years ago, the principal producing fields being located in Clay, Limestone, Shackelford and Webb counties.

Gas from the Clay County (Petrolia) field is piped into some twenty-two towns and cities, including Dallas, Denison, Denton, Fort Worth, Sherman and Wichita Falls. A total of about 500 mi. of pipe lines are used for this purpose. This gas has a heat value of 700 to 750 B.t.u. per cu.ft.

Gas from Limestone County (Mexia field) is piped into Mexia, Teague, Waco and other towns. It is stated that the pressure on the several wells in this field is uniformly about 275 lb. per sq.in., while the depth of the wells varies from 650 to 725 ft. The heat value is relatively high compared with that of the gas from some of the other fields, being over 1,000 B.t.u. per cu. ft.

As far as I am able to learn, no extraction of gasoline from natural gas is practised in Texas for commercial purposes, although an experimental yield of 3½ gal. of gasoline per 1,000 cu.ft. of gas was obtained on natural gas from Electra. This amount was about 35 per cent. more than the yield from natural gas from West Virginia, which is the chief state producing gasoline by this method.

University of Texas Bulletin No. 365 states that "the total value of the natural gas, 1909 to 1913, amounted to $5,068,128. During the three years ending 1913, the total amount of natural gas produced in Texas was 25,183,521,000 cu.ft., valued at $4,493,845, or a little over 17c. per 1,000 cu.ft."

Statistics show that the greater portion of the income from natural gas for 1912 was received for gas supplied for domestic purposes. This was nearly double that received for manufacturing and power purposes; however, it should be remembered that the rate made for gas consumed under steam boilers is about 9 or 10c. per 1,000 cu.ft. only, while the domestic rate is about 50c. per 1,000 cu.ft., subject to a sliding scale discount. Furthermore, gas engines, large and small, generally take the domestic rate.

Cost of Available Heat Energy from Texas Fuels

Since the use of wood for fuel is confined chiefly to farms and small towns, it is hardly worth consideration in comparison with the other fuels referred to for operating industrial manufacturing plants.

Coal, lignite, petroleum and natural gas are more or less in competition with one another, however, over a large portion of the state, in supplying the fuel demands for power purposes and in the operation of steam boilers.

It is well known to engineers that the actual cost of say 1,000,000 B.t.u. laid down at any given power plant as potential energy, whether as coal, lignite, oil or gas, is an entirely unsafe criterion to follow in the purchase of fuel to effect the most economical operation.

It is true that the calorific value of a fuel is significant. This is much more the case in making comparison of fuels of the same class, than with those of different classes. The reason is readily discernible, because as among the different fuels, coal, lignite, oil and gas, the potential energy stored in a given quantity of the fuel is less significant than the total heat units that will become actually available in producing steam. Each class of fuel requires certain modifications in plant characteristics, in order to obtain the maximum available heat energy. This should not be overlooked by the purchaser in changing from one class of fuel to another.

The type of boilers, character of settings, shape and volume of furnaces, grates, bridge walls, amount and control of draft, location and number of burners, most effective atomization of oil, variation in gas quality and pressure, necessary handling and storing of fuel, and the cleanliness of the plant, are some of the important features that must have consideration in order to effect economical operation. Again, some coals that show a high B.t.u. value on laboratory test contain impurities which cause much trouble and an excess cost, in order to make available a reasonable part of their calorimetrically shown heat value.

Lignite, if stored in the weather, slacks rapidly and reduces to powder to a considerable extent, while with the ordinary method of hand firing this fuel on stationary grates, a large portion is likely to be wasted through the grates. A considerable saving of lignite can unquestionably be effected by the use of rocking grates of the Martin or McClave-Brooks type. I have had personal supervision of plants where these grates have saved 6 to 8 per cent. of the lignite formerly used on stationary grates.

This saving is effected in two ways at least—less lignite is forced through the grates and the fire doors are kept closed more of the time because slicing the fire is practically unnecessary. The work required of the fireman is somewhat reduced also, a fact which he always appears to appreciate.

In the economical burning of oil, opinions are expressed concerning the position of burners, front, rear, sides and bottom. However, experience has convinced me conclusively that the position in general is practically inconsequential, as is also the type of burner. The significant features are unquestionably, first, the atomization of the oil and uniform flame distribution in a furnace properly constructed for oil burning, and second, the burners should be so placed that the number in use may be varied with load demands upon the boiler.

As ordinarily constructed, the order of boiler furnace efficiency from the highest to the lowest for the classes of fuels mentioned is oil, natural gas, coal, lignite. Considering average good conditions for burning these fuels under steam boilers, with such modifications as may be required for each particular class, the cost of 1,000 hp.-hr. output will closely approximate $8.25 for each class, when costs are as follows:

Coal	13,000 B.t.u. per lb. at	$3.00 per ton
Lignite	8,000 B.t.u. per lb. at	1.65 per ton
Oil	18,500 B.t.u. per lb. at	1.00 per bbl.
Natural gas.....	700 B.t.u. per cu.ft. at	.09 per 1,000 cu.ft.

The oil engine and the gas engine are coming to be more and more important in supplying power demands,

in competition with steam operated plants. The internal combustion engine is becoming more standardized in construction and materials, and consequently more reliable. For small power plants, and particularly those which would be operated noncondensing, and subjected to variable load conditions, the economy of the oil-engine over the steam-engine plant is significant, even when all fixed as well as operating and maintenance costs are given full consideration.

The increase in number of crude-oil engines in Texas during the past five years has been pronounced, and is likely to be further augmented as time and economical services rendered demonstrate their economy and reliability. The present horsepower capacity of operating crude-oil, high-compression engines in all parts of the state may be conservatively estimated at 21,000. This includes engines built by the following companies: Allis-Chalmers Manufacturing Co., Busch-Sulzer Bros.-Diesel Engine Co., De La Vergne Machine Co., Fulton Iron Works, Lyons-Atlas Engine works, McIntosh & Seymour Engineering Corporation, Nordberg Manufacturing Co. and Snow Steam Pump Works.

Statistics are not at hand concerning the total capacity of natural-gas engines in operation in the state, but producer-gas engines aggregate about 12,000 hp., as previously stated.

There is also to be considered a relatively large total capacity in low-compression type engines of the Hornsby-Akroyd and Fairbanks-Morse types using intermediate oils, probably over 15,000 hp., together with the thousands of motor-boat, automobile and small stationary engines, operating on the light distillates, gasoline and naphtha, from Texas crude oils.

Oils Need Refining

While this paper is chiefly concerned with the natural products of the state, used as *fuels* specifically, it should be said that in so far as crude oil is concerned, *as such*, its value is far less than that of its fractionations for fuel, lubrication and other purposes.

Crude oil has the general chemical formula, $C_nH_{2n}+2$, commonly designated as the paraffine series of hydrocarbons. This series beginning with CH_4, or methane (gas), continues as C_2H_6, ethane (gas), C_3H_8, propane (gas), C_4H_{10}, butane (liquid), at 1 deg. C. and normal barometric pressure, through a series of liquids to $C_{30}H_{62}$, which is a solid wax at ordinary temperatures, either paraffine or asphalt, which is the polymerized paraffine base.

As liquid fractionations produced by heat or chemicals, or both, from the lighter to the heavier products we have rhigolene, gasoline, naphtha, kerosene, intermediate, or gas oil, light lubricating oils and heavy lubricating oils. It is a well known fact that the heavier lubricating oils for engine cylinders must possess definite characteristics as to viscosity, volatility, flash point, base, etc., in accordance with temperature conditions in the cylinder, in order to act as efficient lubricants. Under the higher temperatures an asphalt base oil tends to carbonize, while the paraffine base oil tends to "crack" into a lower order of paraffines, C_nH_{2n}, and will continue to act as a lubricant, where the carbon resulting from the decomposition of the asphalt base oil would not.

As to the general significance of the fuel resources of Texas, it may be said that in the year 1900 the capital invested in manufacturing in the state was about $63,500,000; now it has reached figures approximating $300,000,000, and if the greatest advantage were to be taken in the use of the enormous tonnage of fuel that exists in the lignite territory alone, the cheap power produced would undoubtedly give a further impetus to this development of manufacturing in the state.

Texas presents unparalleled conditions for the long distance transmission of electric power. This is now being evidenced by several hundred miles of 60,000-volt lines in the northern part of the state. Under such conditions of cheap power as are believed to be entirely possible, nearly all of the many cotton gins, oil mills, flour mills, irrigation plants and public service utilities in the north part of Texas would find it economical to use electric instead of steam power. Existing plants would be increased, and many other industries started.

In the southern portion of the state such power could be utilized to the fullest extent for rice, sugar and lumber mills, irrigation and cement plants, and the handling of merchandise on the wharves of Texas ports.

It is significant in this connection to state that during the six years prior to 1912 Texas City increased the amount of freight handled from 8,712 tons to 464,201 tons, and Galveston increased its freight handled from 567,160 tons to 1,369,296 tons entered, and from 842,194 tons to 1,815,031 tons cleared.

The distance necessary to transmit electric power to serve the industrial requirements, both north and south, can readily be covered, and the fact should not be lost sight of that while an increased amount of power will be required to keep pace with the further industrial development which will unquestionably come, there results when gas power is used instead of steam a conservation of substantially 50 per cent. of the lignite fuel required.

It appears to me that in the general development and industrial progress of the state which promises much for the future that consideration should be given to the importance and application of the fuel resources.

The value of crude oil is far greater for other purposes than for burning under steam boilers, or even in stationary engines. Natural gas offers a convenience and comfort to thousands of people for domestic purposes, if it be not burned to produce steam.

Why, then, should not the oil and gas be conserved to supply the greatest needs, and benefit the greatest number of people, particularly when the supply is decidedly undeterminate?

And again, why should not the lignite and coal areas be made to yield the fuel for industrial operations and development, when the supply is known, and is undoubtedly sufficient to last a thousand years with any probable industrial expansion?

The idea advanced, however, of utilizing in the most economical manner the coal and lignite areas, may be left for a future generation to act upon, partly because of inattention and partly because of the relatively large amount of capital which would be required.

In the meantime, if the supply of crude oil and natural gas shall continue such that the price to industrial firms is low, the internal combustion engine will find its way into thousands of industrial plants and the conservation of Texas fuels, as well as the advent of almost universal electric drive, will be deferred until an indefinitely distant future.

Reconstruction of the Benham Tipple

By H. B. Cooley*

SYNOPSIS—The original wooden tipple had been designed without any particular reference to the preparation of domestic coal. The new equipment, designed for the preparation of both domestic and coking coal, was built and put in operation with only an inconsequential loss of time, and that occurred during a severe car shortage.

The replacing of an old and inadequate screening equipment, shown in Fig. 1, by the new and complete coal-handling plant shown in Figs. 2 and 3, with but five days' delay in loading coal, is one of the interesting features of the work recently completed at an eastern Kentucky colliery.

The plant, as well as most of the other older ones in this section, was originally planned for the primary purpose of preparing coal for coking, and but little consideration was given to any arrangement for making the sized grades of domestic coal now in demand.

The problem which confronted the engineers employed to remodel the plant was to devise a plan whereby either a part or all of the coal could be crushed for the coke ovens and, further, arrange to load clean, sized coal in gondolas and box-cars. All this was to be done without loss of time in supplying the coke ovens and with as little interference as possible in loading market fuel.

The coal is mined from a drift opening, the mouth of the drift being about 135 ft. above the railroad track level at the foot of the hill.

The tipple before reconstruction was operated as follows: Coal was dumped from mine cars with lifting end gates over a Jeffrey-Griffith patented dump, chuted into an 8-ton hopper with a 30-deg. pitch bottom, the pitch being at right angles to the center line of dump track. It was then fed by means of a small plate feeder to a 15 x 36-in. flight retarding conveyor, which lowered it on a 26-deg. slope to a point midway between the dump and the railroad tracks at the foot of the hill. Here the coal was either screened and the slack passed to the crushers and thence to a 500-ton slack bin, or by means of a gate in the screen run-of-mine coal could be delivered to the crushers. Normally, the coal passing over this screen was lowered by a retarding conveyor of the same type as the one mentioned above to a set of shaker screens at the track level, where egg and block coal were loaded for market, and the degradation elevated to the crusher bin by a 6 x 12-in. flight conveyor.

The two most undesirable features of this arrangement were the inadequate facilities for handling a large tonnage of egg and block coal with minimum breakage and the necessity of a mechanical means of carrying mine-run coal from dump to crusher bin.

To remedy these defects considerable new machinery was required, and care was given in locating the new material so there would be a minimum interference with the old, and at the same time serve every purpose for which it was intended.

The new slack screen, feeder and feeder hopper, shown in Fig. 4, were located at the side of the old retarding conveyor, with provisions for a quarter-turn dump chute to replace the old 8-ton hopper mentioned above. All the machinery shown in Fig. 4, except the quarter-turn dump chute at the top, was installed and tested before any changes in the old equipment were attempted. All possible preparation having been made, commencing at 5 p.m. Saturday, the old dump chute was removed, the

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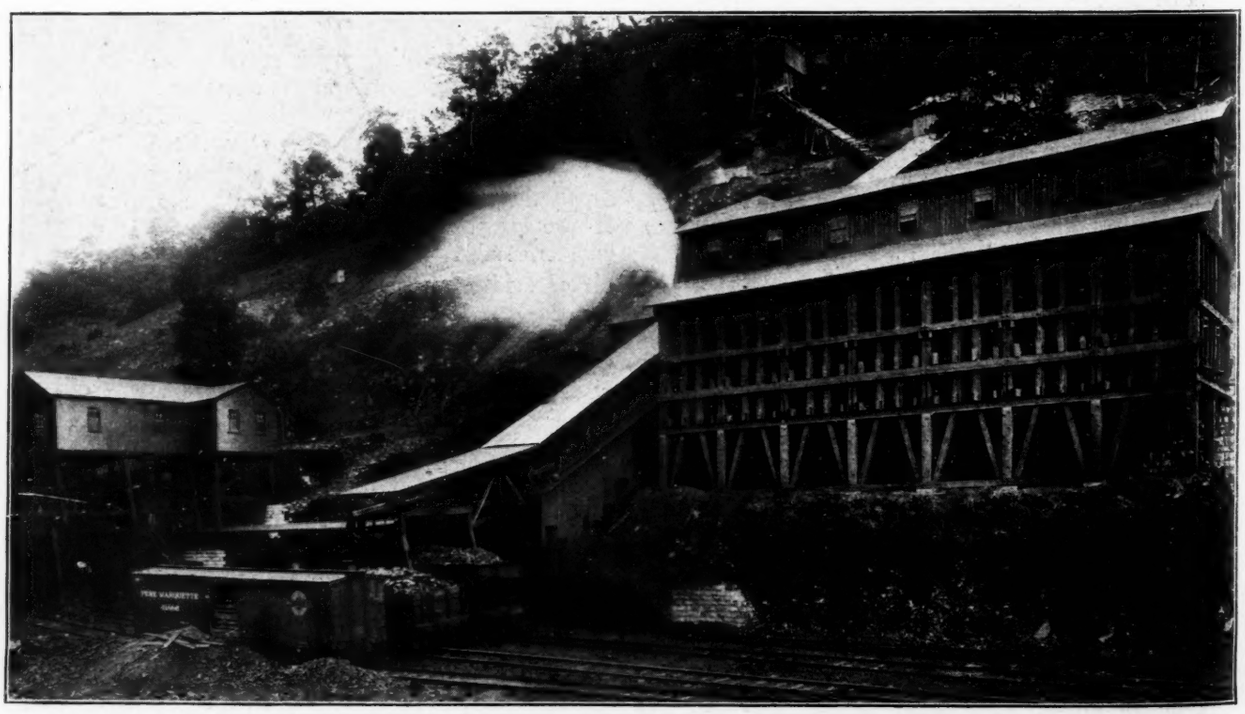


FIG. 1. GENERAL VIEW OF TIPPLE BEFORE RECONSTRUCTION

new quarter-turn chute replacing it was put in position, and a gravity mine-run chute, shown at the right in Fig. 4, built from dump chute to crusher bin. This chute, 120 ft. long on a 26-deg. slope, then made it possible to operate the mine the following Monday, using the entire output for coking purposes only.

By the following Wednesday the old slack screen over the crusher bin had been removed and the upper and lower retarding conveyors connected up to bridge the space formerly occupied by the old slack screen.

Referring again to Fig. 4, it will be seen that this new equipment has several unique features. The use of the "Petersen" patented pendulum hanger, carried by cast-iron stands, gives the screen a decided vertical as well as horizontal stroke. This helps to clean the coal and causes it to flow easily over the 15-deg. lip screens. The successful operation of a single-leaf screen of this size, it is believed, is without precedent, this also being made possible by the use of the pendulum hanger, which reduces the driving-rod stress to a minimum.

Fig. 3 shows the drive mechanism. The two chain drives operate the feeder plate and retarding conveyor.

As none of the tracks could be blocked, it was necessary to erect everything with a gin pole and winch. The electric hoist shown in Fig. 5 was made from machinery later used as picking-table drive. The cast-iron spool was the only part not used in the machinery layout. This spool, or niggerhead, was mounted on a $3\frac{15}{16}$-in. shaft driven through a worm gear and one set of steel gear reductions by a $7\frac{1}{2}$-hp. motor.

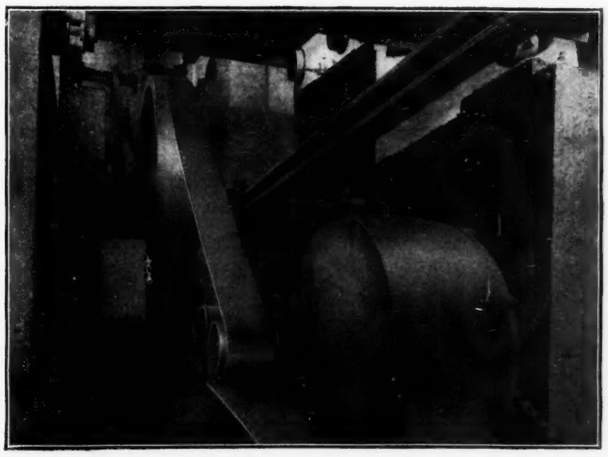


FIG. 3. UPPER-SCREEN DRIVE

The problem of replacing the old wooden shaker shed by a new steel one on the same center line was solved by erecting the new structure on the down-track side of the old, on a temporary foundation, and later moving it into place. Plenty of heavy timber cribbing was available for building this temporary foundation, the principal difficulty being to so locate the cribs as not to foul the track clearance which had necessarily to be maintained nor the old wooden structure.

The fact that the steel design had not provided for any means of temporary erection also made the question of adequate supports for the structure a difficult one.

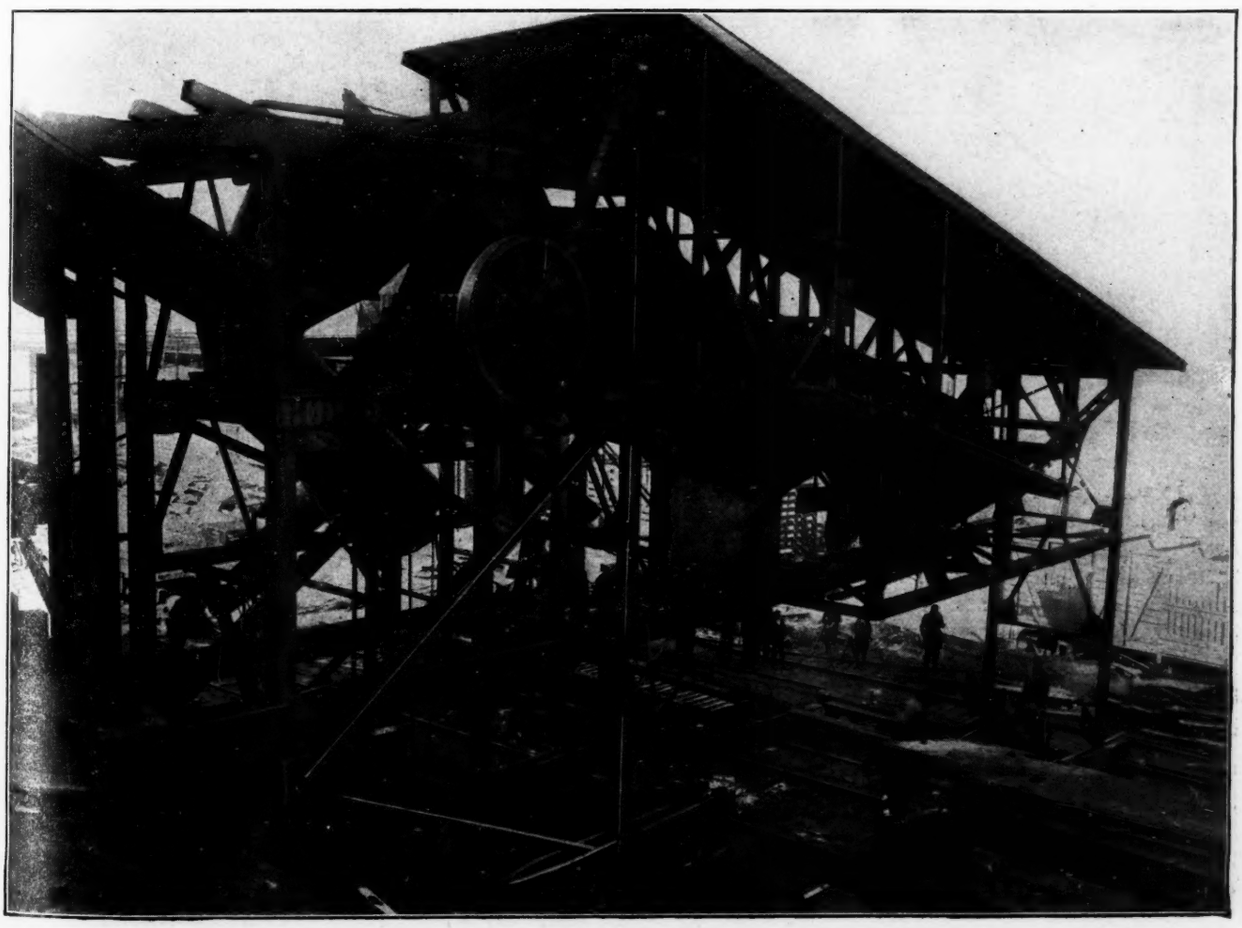


FIG. 2. STRUCTURE SUPPORTING LOWER SCREENS

Fig. 6 shows the typical scheme used to support the columns on the movable foundation. Combined wood and steel tracking was laid on timber mud blocks, and between the two sets of tracking $2\frac{7}{16}$-in. solid rollers were placed. These rollers were cut from worn-out mine-car axles. To transmit the column load to the tracking, 10- and 12-in. steel channels were used, the computed stress in these channels being less than 16,000 lb. per sq.in. under full load.

After completion of erection, the machinery was given a thorough trial in its temporary position before the work of moving it into a permanent location was started. To insure a minimum shutdown, no attempt was made to salvage the old machinery or wooden structure, and it was put in the clear in less than a day by pulling it to the ground on the up-track side with the company switching locomotive. Only three hours were required to roll the new steelwork into place, the remainder of the four days following being used to rebuild the lower end of the retarding conveyor and install the picking tables.

This loss of five working days was not especially serious because the car shortage was particularly severe at the time.

As a tribute to the rigidity of a well designed steel shaker-screen support, it is interesting to note that the coal was run over these screens for several months before the set of columns shown in Fig. 6 was securely anchored to concrete piers. This operation of the machinery in a structure unsecured to its foundation would have been impossible had unbalanced stresses been excessive. The pendulum hanger doubtless played no small part in thus reducing the stresses on the supporting framework and rendering it possible to run this preparation equipment without secure anchorage to its supports.

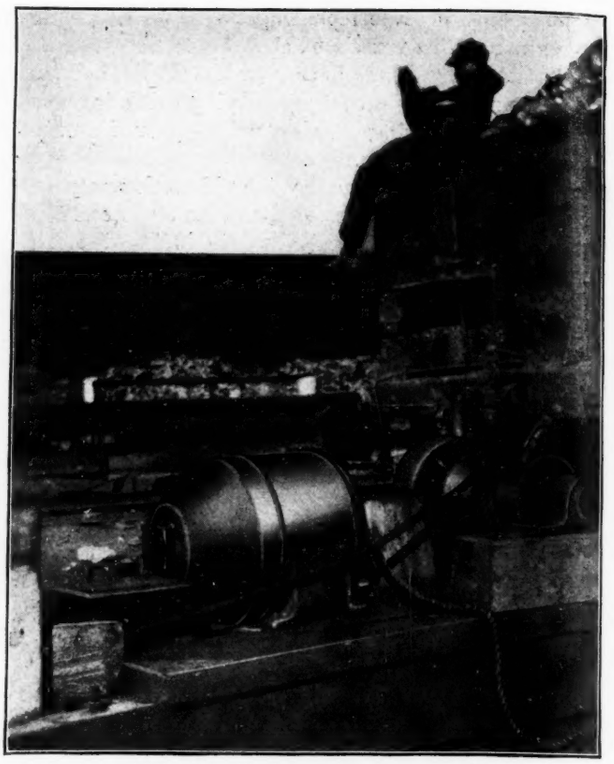


FIG. 5. ELECTRIC ERECTING HOIST

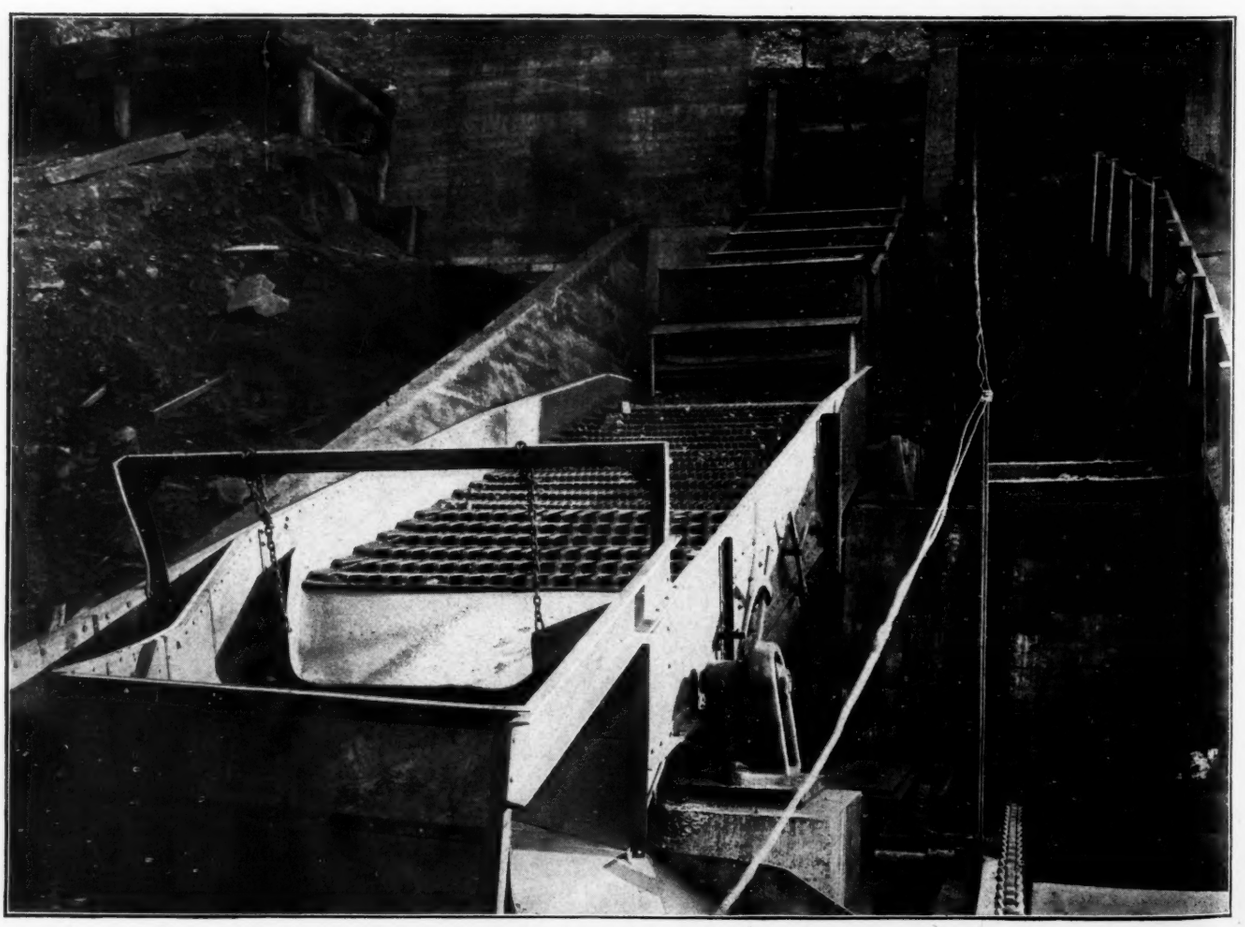


FIG. 4. UPPER SCREEN, DUMP HOPPER AND MINE-RUN CHUTE

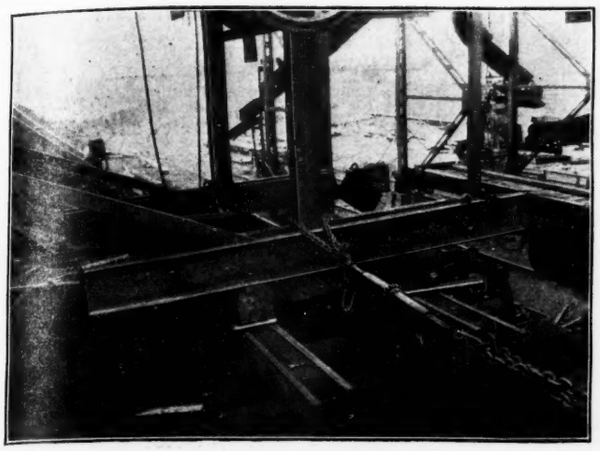


FIG. 6. DETAILS OF CONSTRUCTION

The work was designed and erected by the Allen & Garcia Co., consulting and constructing engineers, of Chicago, for the Wisconsin Steel Co., Benham, Ky., the writer serving as field representative for the engineers.

Netherlands Facing a Coal Crisis

By Charles R. Flandreau*

The European War has seriously affected the coal supply of many countries. The belligerent nations are suffering, more or less, from their inability to obtain sufficient coal to meet their needs, and France has asserted that she is in danger of serious trouble in this regard. The other nations, however, have thus far succeeded in maintaining their economic equilibrium under conditions about which we know little but conjecture much. Australia, because of her unsettled labor conditions, has seriously hampered the British coal supply and is herself suffering great privations at present as a consequence of her protracted coal strike.

And now Netherlands, the commercial go-between of the belligerents, is in imminent danger of being plunged into the most dire straits by reason of a lack of coal. An intimation of the acuteness of the situation was given when the government recently issued a warning to the people to be as economical as possible in their consumption of gas and electricity because of the shortage of coal.

The latest reports reaching this country from the Netherlands would, however, seem to indicate that the warning of the government was utterly inadequate in staving off the crisis. At the time the warning was issued, the execution of the official request was left more or less to the people themselves to follow or not as they saw fit. The gravity of the situation has increased to such a point that government officials are now using the most drastic means in enforcing the requested economy.

In Amsterdam, the usual charge of seven Dutch cents ($0.028) per cubic meter of gas consumed was doubled on Dec. 6 for all consumption above a specified quantity. The charge for electricity, which has hitherto been from 4 to 7 American cents per kilowatt-hour, according to the particular use, has been increased from 50 to 100 per cent. for all kilowatt-hours above a certain number. The prescribed maximum quantity in each of these cases is little if any above the normal consumption of the smaller users in normal times.

Business houses, factories and other large users of both services are therefore much disturbed and are not backward in voicing their protest over the increase. The government, however, merely states that the increase is only a temporary arrangement and not intended to increase the revenue. Considering that the increase in many cases costs the larger concerns, who are forced to do much of their work at night, large sums, sometimes as high as $100 per week, it is not surprising that there should be more or less protest against the increase.

The unusual shortage of coal has precipitated a series of new regulations which took effect on Dec. 6 last. Coffee-houses and similar places in Amsterdam must now close at 12 o'clock midnight. Theater performances must close at 11 o'clock. Retail shops must close not later than 9 o'clock. And already the ferry service across the harbor is materially affected.

One street-car line which was deemed unprofitable has been discontinued and, as an apparent indication that the street-car service in general will further be curtailed, it has been announced that eight "hanger-straps" will be allowed in a car. Heretofore such necessary American commodities have not been allowed on the cars at all. The number of persons allowed to stand on the rear platforms of cars has also been increased.

Similar regulations have been taken throughout the country, although some are even more restrictive as to hours of closing, etc. The general effect, however, is the same and is being felt materially in all parts of the Netherlands.

*Washington, D. C.

A Powerful Locomotive Will Haul Reading Coal

During the initial tests of a new type of engine recently received by the Philadelphia & Reading Railway Co. for use on the mountain haul from St. Clair to Frackville, one of these monster locomotives pulled up this heavy grade twice as heavy a train load as was formerly hauled by the "bull moose" type of engine which it is replacing and which until now was the most powerful machine of its kind in the anthracite region.

The engine has a total weight of 282½ tons and the driving wheels are 52 in. in diameter. The high-pressure cylinders measure 36 in., and the low pressure ones are 40 in. in diameter. Automatic stokers provide a constant feed to the firebox, the fuel being conveyed through a worm-screw attachment operated by a wheel from the rear of the firebox.

Evidence of the great pulling power of these engines was shown in the trip of the first to be tested. On that occasion a train load of 3,500,000 lb. was hauled up the heavy grade, and at the satisfactory speed of about half as fast as the time schedule for passenger trains. Because of the immense size of the engines, the company is placing 130-lb. rail on the grade, and an additional clearance of 30 in. has to be provided along a part of the right of way.

Of course, these engines, though heralded as the most powerful built, are not nearly so large as the engines recently installed on the Virginia and the Erie railroads which each had a total weight of about 422 tons.

War—and the Coal Industry

Under this heading in Coal Age each week we hope to publish items relating to war measures as they affect the coal-mining industry. We earnestly invite all our readers to send us interesting notes covering happenings which bear on the war, either in a military or an industrial way.—Editor.

The Lehigh Valley Coal Co. has begun the inclosing of its local collieries with barbed-wire fences, as a measure against possible intruders.

Fearing attempts to wreck its property, the Springfield District Coal Mining Co. has placed a large force of watchmen to guard its mines at Springfield and at other places in the central Illinois field.

The extensive McCurtain coke-oven plant of 200 ovens which was erected near Fort Smith, Ark., 12 years ago, but has never been in operation, will start up shortly, due to the abnormal coke demand that the war has created.

The Pierce Medical Association of Buffalo has placed at the disposal of President Wilson 25,000 acres of coal land at Pierceton, Ala., for the use of the Government during war time. The mine is fully equipped and produces a high grade of steam coal.

Proofs of M. R. Campbell's map of the coal districts of the United States have been supplied to the War Department by the United States Geological Survey. The map, which is nearing completion, is by far the most complete map of this character ever attempted.

At a meeting of the Hazard (Ky.) Coal Operators' Exchange, held in Cincinnati, Ohio, recently, resolutions were adopted indorsing the action of the National Administration in connection with international matters and pledging the hearty support of the organization.

E. H. Gary, head of the United States Steel Corporation, says the United States carries into the war the essentials to victory over the German government—namely, unlimited credit, unlimited supplies and, if necessary, unlimited man power. Topping all is the moral power of the American democracy.

At a weekly luncheon and dinner of Columbus, Ohio, wholesalers held Apr. 6, many of the shippers said they believed the war would both strengthen and extend the market for Ohio and West Virginia coal, since much of the Pocahontas and New River coal which has been coming westward will be required for war purposes at the seaboard.

A military company is being organized by the employees of the Vesta No. 1 mine now being opened at Dunlevy, Penn. One hour every morning and one in the afternoon are spent in drilling. J. W. Downer is instrumental in the work of organization and Superintendent Dunlap has offered his assistance. The company will shortly be equipped properly and made ready for any call.

Miners in Fleming, Haymond and Hemphill, Ky., employed by the Elk Horn Mining Corporation, and those at the McRoberts, Jenkins and Burdine mines owned by the Consolidation Coal Co., also in Kentucky, have been urged to plant every available foot of land around their premises this spring, and raise potatoes and garden vegetables.

The offer of W. J. Richards, president of the Philadelphia & Reading Coal and Iron Co., to furnish large tracts of idle land in the anthracite region, has been eagerly accepted by the miners and other employees of the company. It is believed that the neglected tracts in this region will be able to furnish thousands of tons of food if properly cultivated.

At the special convention in DuBois, Penn., of District No. 2, United Mine Workers, called to secure a readjustment of the existing wage scale, George Bassett, of South Fork, in a ringing speech for patriotism, offered a motion that the delegates go on record as pledging their allegiance to President Wilson in his attitude toward Germany. The motion was carried unanimously.

The Hampton Roads piers, which are the principal source of supply for the navy and the Panama Canal, are under a heavy guard of soldiers. During the past week several shippers have experienced considerable trouble in reference to coal shipments in neutral vessels to foreign ports. All information pertaining to United States and foreign shipments is rigidly withheld.

With the country at war, and preparations being made to protect property, coal companies in Pennsylvania will safeguard their mines and buildings through special police, the appointments being made by the governor upon their request. The companies will act on their own initiative and ask that their coal and iron police be commissioned as special officers for guard duty. These men are being selected from among company employees.

In response to an inquiry as to the rumor that soft-coal miners of the country would strike unless given an increase of 20 per cent. in wages, Frank Farrington, president of the Illinois United Mine Workers, wired that he had no reason to believe there would be such a strike. "So far as I am able to influence them," he telegraphed, "Illinois miners will respect the provisions of their joint wage agreement, which does not expire until Mar. 31, 1918."

Seditionary placards that approach treason have been posted in Old Forge, Jessup and other Pennsylvania coal towns by the Industrial Workers of the World. The men who posted the placards and the men who authorized them are liable to drastic punishment, and government men are already trying to apprehend them. "Join the I. W. W.'s;

keep away from war; don't join the army," says one. Another reads: "Why be a soldier? Be a man; join the I. W. W.'s and fight on the job for yourself and your class." The placards have been tacked to telegraph poles, trees and buildings.

About a thousand residents of Old Forge and surrounding towns in Pennsylvania, joined Saturday, Apr. 7, in showing their patriotism and reverence for the Stars and Stripes at a flag-raising by the Pennsylvania Coal Co. employees at its Old Forge colliery. Captain W. A. May, president of the company, District Superintendent Joseph P. Jennings, Mine Inspector Jesse Palmer and many other officials of the company were present. All the employees of the company had a part in the flag-raising. The movement for the flag was started by Christian Kraft, of East Scranton, outside foreman at the colliery.

The resolution passed by Congress not only formally declares that a condition of war exists, but also gives the President authority to defend the country from within and without. This authority is not qualified, and it is argued that under it the Executive possesses sufficient authority, not only to fix a maximum price upon coal and other commodities, but also to direct its equable distribution. If it is ultimately determined to fix a maximum price upon coal, the Advisory Council would undoubtedly assume jurisdiction. The Bureau of Mines would probably be called in as a consulting body.

The exemption of workmen in coal mines from military service is being discussed by coal specialists and officials of the War Department. This country, it is expected, will profit by the lesson taught by the European countries in allowing their miners to enlist, only to be called back from the trenches. With the country facing a serious coal shortage, it is realized that the gravity of the situation would be greatly increased if the call for men should be allowed to deplete the labor supply of the coal-mining districts. The coal situation presents such a serious aspect that some favor the appointment of a fuel board with plenary powers.

War conditions, such as have existed in the belligerent countries of Europe, promise to be reproduced in the United States before much progress is made under the new situation. The Council for National Defense has organized an economy board, the duties of which will be to devise means for the most economical distribution of food and supplies, not only to the military forces, but also to the civil population of the country.

One of the suggestions made is that the Federal Government fix a maximum price on all important commodities required in ordinary daily life, as well as those needed for the military establishment. Coal is not the least important of these commodities, and in view of the considerable needs of the navy for fuel, it is anticipated that it will receive first treatment.

From the Greensburg-Irwin field in Pennsylvania, 1500 men with a practical knowledge of first-aid work are available for Red Cross service. This same district can also supply 100 men experienced in mine-rescue work. These latter could be used in combating the poisonous German gas bombs. Five hundred and fifty of the first-aid workers have certificates of proficiency from experts in first-aid work, while 85 men have been examined by Government experts in the use of mine-rescue apparatus. Many of the first-aid workers have already signed up with the Red Cross Society, and if volunteers are called for, it is expected that practically every man with a thorough knowledge of the work will offer his services.

The sentiment of the Administration in the present strenuous times was recently displayed by the manner in which a certain company was treated by the Navy Department. This firm was making torpedoes for the navy and the price demanded was considered exorbitant. The Secretary of the Navy refused to pay the price demanded and offered the company what he considered a fair price, threatening to commandeer the plant of the company if that price were not accepted. Under the Naval Act, the Department has authority to commandeer any plant which may be needed for navy purposes. It is assumed the Federal authorities will follow this precedent. Gambling in commodities or the taking of excess war profits will be prevented, and those who attempt to make such profits will be prosecuted.

To put all these policies into force will require an extensive executive force. It is questionable whether or not the present cabinet officers will have sufficient time to divide the duty among themselves and, therefore, the President is being urged to create one or more cabinet positions. One of the new executive branches being urged is that of Secretary of Transportation and Communication, and it is rumored that probably Daniel Willard, president of the Baltimore & Ohio R.R., would be offered the position.

Another cabinet office which is being talked of is a Secretary of Munitions. Under munitions would be included, naturally, fuel and food supplies, as well as arms and ammunition. For the time being, President Wilson has not indicated any keen fancy for these suggestions, but they indicate the seriousness with which these subjects are now being discussed. Furthermore, they are but a mild indication of what extremes the Government may go to in prosecuting the war to its successful conclusion with the least inconvenience to the greatest number of people.

COMING MEETINGS

Illinois Mining Institute will hold its next meeting on May 17, 18 and 19, at La Salle, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society for Testing Materials will hold its annual meeting June 26-30 at Atlantic City, N. J., with headquarters at Traymore Hotel.

International Railway Fuel Association will hold its annual meeting May 14-17 at the Hotel Sherman, Chicago, Ill. Secretary, J. G. Crawford, Chicago, Ill.

Canadian Retail Coal Association will hold its annual meeting at Toronto, Ont., Canada, June 14 and 15. Secretary, B. A. Caspell, Brantford, Ont., Canada.

American Society of Mechanical Engineers will hold its spring meeting May 21-24 at Cincinnati, Ohio. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

Mine Inspectors' Institute of the United States of America will hold its tenth annual meeting July 10-13 at Indianapolis, Ind. Secretary, J. W. Paul, Bureau of Mines, Pittsburgh, Penn.

Indiana Retail Coal Merchants' Association will hold its first annual convention at the Hotel Severin, Indianapolis, Ind., Wednesday and Thursday, Apr. 25 and 26. Secretary, R. R. Yeagley, Logansport, Ind.

The Labor Situation

General Labor Review

The United Mine Workers of America on Apr. 2 celebrated the establishment of the 8-hour day from one end of the unionized coal field to the other. In the anthracite region the rejoicing was more than usually intimate. Prior to this year, the mine workers in the anthracite region were asked to rejoice with those in the bituminous coal areas, because of the fact that the men in the latter region had been given an 8-hour day, though the anthracite mines did not at that time have so short a working period.

The 8-hour day in the anthracite field was not granted till May 5 of the past year, so the men could not celebrate its accomplishment on the first weekday in April, even though the agreement when completed was made retroactive to that date. For this reason, the celebration in the hard-coal region was more hearty this year than usual.

President White Again Advocates Four-Hour Day

John P. White, the president of the United Mine Workers, was present and declared that "if the miners of the United States worked for only four hours a day, they could supply adequately the demand for fuel." The mine workers are prepared to urge less hours of work than eight, and the public generally will have to decide what is going to be done about it.

It seems that if the mine workers can do their bit in such a small proportion of the day some of them should go into other work. It is unfortunate that at this time a lot of farmers are going into the coal business in the bituminous regions as loaders and haulers of coal, while numbers of real miners are idle. The number of new mine workers is growing apace, though numbers have concurrently been leaving for munition works.

The farmers are naturally drawn to mining from their proper work, for mining gives an immediate return. The man who opens a mine can sell his coal immediately and secure a profit. The man who digs coal can get his pay as soon as the mine owner gets his returns, or even earlier, but the farmer must wait on the seasons, and consequently there is a lure from the farm to the mine.

Less Hours Would Not Provide Steady Work

There is something radically wrong with the bituminous coal business. The disease may be diagnosed as excessive stimulation resulting from railroad stagnation and seasonal stimulations consequent on the large winter demand. To reduce the number of hours worked will have no effect on correcting such stimulations.

In what follows it will be assumed that the mine workers are now actually working an 8-hour day, though this is by no means a fact. Let us assume for the moment that the miners hereafter work four hours instead of eight hours per day. As a result, we shall then need 1,500,000 men at the mines in the winter instead of 750,000 men.

The men will still work only 50 per cent. of the calendar days in the summer. The people are not going to go without coal in the winter, or in other times of big demand, and the number of miners will be determined by the number needed in the winter.

Reduce Peak Loads and Avoid Standby Units

The cause of irregular operation is irregular demand, and the cure for it a regularizing of the call for coal, which can only be secured by a seasonal freight, wage and price regulation. Even with these balance wheels perfect regulation may be impossible and it may be necessary to ask the miners to work 9 hours in the winter and 7 in the summer. Some of the miners who have left the farm might then be safely induced to go back to their old occupation.

The cure for idleness is not to provide for idling by union regulations, for that is no cure. The cure of cures is to regulate the work to be done, to smooth out the load curve, as electricians would say, and thus reduce the number of stand-by units. We must cut down peaks by penalizing the customers who cause us to have them, and then we must demand that the units which we employ to produce coal produce a reasonable overload when conditions require it.

In the anthracite region the union is still troubled by the fuss about the three Shenandoah locals that were expelled from the union for illegal payments to members who struck contrary to contract and to the rules of the union. The locals thus expelled are seeking reinstatement by means of a court injunction. So far they have been unsuccessful, because the officers of the court could not make a service on the persons they sought to enjoin, as these parties were living outside the state. But the trip of John P. White to the anthracite region to celebrate the 8-hour day furnished an opportunity, and service was made on him on Apr. 5. Ex-Congressman James B. Reilly, of Pottsville, will defend Mr. White, his coadjutors and the right of the officers of the union to expel locals that violate the constitution of the organization.

Lugubrious Joys of the Frequent Funeral

When the Workmen's Compensation Law came into operation, the G. B. Markle Co., of Jeddo, suspended indefinitely an arrangement by which it agreed to share with the workmen in a fund providing for the funeral expenses of mine victims. The company had stipulated that its participation in this fund would cease should the mine workers close the colliery to attend the funerals of the victims of accidents.

The company and the United Mine Workers' organization have agreed together that the fund shall be reëstablished, and that in consideration of this concession the mine workers will work when the funeral of a mine victim occurs. Thus the company makes a concession to secure a condition which the contract actually calls for.

A section foreman, a fireboss and a driver boss were discharged at the Nottingham colliery, and the employees struck on Apr. 3 for their reinstatement. The company is said to allege that the men were caught in a police raid on a saloon several weeks ago. One of the men, the driver boss, is a cripple and has been employed at the colliery for many years. The miners at No. 9 mine have declared a button strike, as several men have failed to pay their union dues. In all, 1200 men went on strike at the two mines.

Regard Dunmore Vein Work as "Abnormal"

At the Storrs mine at Dickson City near Scranton, a property of the Delaware, Lackawanna & Western R.R., Coal Department, the mine workers on Apr. 8 called a strike because the company officials refused to confer with the grievance committee of the local.

An order of the company requiring the miners to render an account of the time of their laborers to the fireboss of their section has met with a general refusal. The miners are only willing to make this report to the office. Another grievance relates to the mining of the Dunmore vein. The miners claim that it is impossible to make a fair wage in those workings as, according to their statement, it requires a keg of powder to blow out a couple of cars of coal. They urge that the company should pay them the difference between the average wage of the colliery and that resulting from the mining of the Dunmore seam. On Apr. 10 the men returned to work pending a settlement of the difficulties, to be made in accordance with the contract provisions.

Archbald Burgess Objects to Sunday Operations

The Delaware & Hudson Co. has been operating its washery at Gravity Slope, Archbald, Penn., on Sunday and hauling culm to that building from a large pile of fuel on the north end of Archbald borough. James F. Kearney, the burgess, made a forcible protest and threatened to stop the work with the aid of the state police and special policemen. The company concluded not to start operations till 9 a.m. on Sundays, so that the workmen could attend church before going to their work.

The operators in the anthracite region fear a further reduction in the working force because of the demands of the munition plants and the army. The anthracite region is grievously short of men and overloaded with orders. Consequently, it seems likely that enough coal to supply the demand cannot possibly be secured. The claim is that only 80 per cent. of the full force is being employed. As there is no stock supply and culm banks are rapidly depleting, less help from these sources can be anticipated in this year than in the last.

The important event of the week regarding the bituminous regions was the meeting between the mine workers and operators at the McAlpin Hotel, New York City, Thursday,

Apr. 12. It was called to consider whether an increase in wage was advisable and could be granted. The call follows:

Indianapolis, Ind., Apr. 6, 1917.

To the Representatives of the Coal Operators and Mine Workers of the Central Competitive Field, Comprising the States of Illinois, Indiana, Ohio and western Pennsylvania,

Gentlemen—In accordance with the action of an informal conference of representative miners and operators of the territory named above, held in the City of Indianapolis, Ind., on Apr. 5, at which the following resolution was adopted:

"Resolved, that we agree to a joint conference to be held at a mutually agreeable and convenient time and place, for the purpose of considering the question of whether or not an increase in wage scale is advisable and can be granted."

You are hereby requested to attend a joint conference of coal miners and operators of the central competitive field (Illinois, Indiana, Ohio and western Pennsylvania) which convenes at 10 o'clock in the McAlpin Hotel, New York City, on Thursday, Apr. 12, 1917.

The basis of representation for each district within the central competitive field will be the same as that fixed by the last Interstate Joint Conference, namely eight operators and eight miners from each district.

Please arrange to have your association represented at this meeting.

Respectfully yours,
JOHN P. WHITE,
President, United Mine Workers of America.
J. C. KOLSEM,
Chairman, Interstate Joint Conference.
F. C. HONNOLD,
Secretary, Informal Joint Conference.

It may be said here that some sidelights have been thrown on the situation from the Tuscarawas district in Ohio, the Cabin Creek district in West Virginia, the Cambria County district of central Pennsylvania, and the mines on the Cumberland branch of the Baltimore & Ohio R.R. in West Virginia.

Tuscarawas Did Not Wait on Big Conference

To take them in turn, the Tuscarawas district, which lies west of the field usually known as the eastern Ohio district, has conceded the mine workers a 10 per cent. advance, to date from Apr. 2. The other districts of Ohio decided to await the action of Thursday's McAlpin conference, to which reference has been made. At this meeting H. S. Robbins, of Cleveland, will represent the eastern Ohio district, A. A. Augustus the Cambridge field, James Pritchard, southern Ohio, and W. H. Haskins, the Coshocton and Tuscarawas districts. John Moore, Lee Hall and G. W. Savage, president, vice-president and secretary respectively of the Ohio United Mine Workers, and the presidents of the various subdistricts, will represent the mine workers at that conference.

The Cabin Creek district of West Virginia agreed some time ago to place its wage advances on a level with those in competing districts. It has therefore had to increase its wages to meet the increase in the Kanawha district, the scale granted the Kanawha mine workers having been ratified without change on Mar. 30.

Contract the Kanawha Mine Workers Secured

The Kanawha agreement has these liberal stipulations:

First—That the contract be established upon an eight-hour basis as in effect in the central competitive fields, and the United Mine Workers of America of District 17, with the assistance of the International organization, will see that it is carried out in its true sense.

Second—That a full recognition of the United Mine Workers of America is granted and the amount of the check-off to be mutually agreed to by a clause to be incorporated in the contract with the understanding that such men are exempt that are included on page 14, Rule 33, headed "Membership in the U. M. W. of A." of the present agreement.

Third—That a flat increase of six and one-half cents (6½c.) per ton be granted on pick and machine mining based on 2000 lb. per ton.

Fourth—That all inequalities be left to a commission to be appointed by the Kanawha Coal Operators' Association and the representatives of the International Union and District 17; their findings to be submitted with such recommendations as they deem necessary at the next joint convention of operators and miners of this district for adjustment.

Fifth—That the following day wage scale are to be the prices during the life of the agreement:

Drivers, single mule	$2.75
Drivers, two mules	2.91
Tracklayers	2.84
Tracklayers' helpers	2.56
Slate shooters	2.62
Greasers	1.25
Trappers	1.25
Spraggers and couplers	1.50
All other inside day labor	2.50
Motor men and machine runners	2.98

Fifteen per cent. advance on all outside day labor.

Sixth—The term of the contract to be from Apr. 1, 1917, and expiring Dec. 31, 1918.

Seventh—That a committee be selected by this Joint Conference to rewrite the different clauses covering the foregoing and they be incorporated in the present contract now existing.

According to President J. P. White, this agreement means in substance as follows:

Machine mining—Old rate, 32.50c.; new rate, 39c.; per cent. increase, 20. Pick mining—Old rate, 49c.; new rate, 55.50c.; per cent. increase, 13⅓.

INCREASE IN DAY WAGE OF MEN IN KANAWHA REGION

	Old Rate	New Rate	Per Cent. Increase
Drivers	$2.05	$2.75	34
Track layers	2.43	2.84	17
Track layers' helpers	2.00	2.56	28
Slate shooters	2.28	2.62	15
Trappers	.87	1.25	43
Couplers	1.18	1.50	27
Average increase inside labor			27⅓
Increase outside day wage			15

These figures are exclusive of the increase as a result of the establishment of the eight-hour day, which amounts to 12½ per cent.

This contract is not altogether satisfactory to some of the men, who said that the mine workers asked for 10c. a ton increase and should have accepted no less. The agreement was immediately and automatically extended to the Cabin Creek field, thus adding to the earnings of 2500 more mine workers.

Berwind-White Duplicates Former Wage Advance

One of the largest operators in the central Pennsylvania field is the Berwind-White Coal Mining Co., which employs about 6000 men at Winber, Scalp Level, St. Michael and Seanor, near Holsopple. The two towns first mentioned are on the Cambria-Somerset line; Seanor is in Somerset County and St. Michael in Cambria County. This company has promised to add a 10 per cent. bonus to the earnings of its employees to date from Apr. 1. As an advance of 10 per cent. was made early this year, the men will now be making more than 20 per cent. more per unit of work or time than they made last year.

These two increases are not the only evidences of the upward tendency in the mine wage which is bound to affect the action of the central competitive district conference. A strike is threatened in West Virginia on the Cumberland division of the Baltimore & Ohio R.R., where the men have been organized and demand an 8-hour day, an increase in wages and full union conditions by Apr. 16. If compliance with their demands is not secured from the operators by that date, a strike is threatened. The operators have taken no action on the demands, but it is not thought that they will be granted.

Central Pennsylvanians Still Threaten Strike

On Apr. 6 the delegates at the convention of mine workers of central Pennsylvania being held in Du Bois, Penn., voted to "suspend" all operations after Apr. 18 unless the coal operators agree before Apr. 16 to meet in conference with them to adjust the wage contract. The answer of the operators' executive committee framed at the meeting held in Clearfield, Apr. 5, was to the effect that until the central competitive district had acted it was premature for the central Pennsylvania district to take action.

District No. 2 (central Pennsylvania) almost always makes its wage scale after the central competitive district, but in granting its 10 per cent. bonus it reversed the order of precedence. About 42,000 mine workers will be laid idle if there is a strike as a result of this decision of the delegates. After passing their resolution, they adjourned to meet at the call of the policy committee. The officers of the district are authorized to make separate contracts with individual coal companies who agree to abolish car pushing and the charge for the check-off, to cease what are termed "minor violations" of the old contract and to pay 33⅓ per cent. increase in wages.

The "sulk" at the Adrian mine still continues without change except for the fact that the firemen at the mine have joined the other workmen and the mine is now completely idle.

Mines at Clarion, Penn., Give 10 per Cent. Bonus

The Pennsy Coal Co., operating several mines along the Lake Erie, Franklin & Clearfield R.R. in Clarion County, Pennsylvania, has granted its employees a 10 per cent. bonus. The mines affected are the Reed, Gordan, Rodgers No. 3, Cronk No. 5 and Hilltop No. 6 near Clarion, and Dayton No. 10 near Summerville.

Since the disaffection of the Maple Coal Co.'s men at mines Nos. 2 and 3, Holsopple, on Mar. 26, because they did not receive the same increase as the men working for the Victor Coal Mining Co., resulting in a strike of 70 out of the 150 men employed, Somerset County, Pennsylvania, has been working along somewhat uneventfully.

Though District No. 5 (western Pennsylvania) has a number of discontented men, it is not likely that there will be a str'ke for some time, for at a mass meeting of the district held in Canonsburg on Monday, Apr. 2, in commemoration of the securing of the 8-hour day, the mine workers decided to postpone the purposed strike until May 1. The break had been set for Apr. 17 in case the operators failed by Apr. 16 to meet

the mine workers and discuss an increase in the wage scale. The delay was ultimately made so as to give the operators more time to provide for a joint conference.

The Kerr Coal Co., of Freeport, Penn., near the junction of the Kiskiminetas and the Allegheny Rivers, has given way to the mine workers after a year's strike. The mine is not large, and its concession is not likely to have much effect on the labor situation in the vicinity. Cutting and scraping with shortwall machines will be paid at a rate of 15c. a ton, and with a chain breast machine the price paid will be 18c. a ton. Loading will be paid 45c. per ton. The price paid for narrow work will be $2.50 to $3.50 a yard. "Parting shots" will be $2 each. There will be an 8-hour day basis for all employees.

The Lewis Coal and Coke Co., operating at Chelyan, on the Kanawha River, and the Don Coal Co., operating at Eskdale, up Cabin Creek, both in West Virginia, have come into the union fold and have covenanted to give the Kanawha increase in wage, to introduce the 8-hour day and to recognize the union.

The Boomer Coal and Coke Co. at Boomer and the National Bituminous Coal Co. at Crown Hill, in West Virginia, are having trouble over the distribution of the 8-hour day between the morning and afternoon. At Kayford there was a similar dispute, but it was easily settled.

Apr. 1 an Emancipation Day for Operators

Some of the operators in West Virginia were considerably disadvantaged by long-time contracts and looked upon Apr. 1 when the price contracts expired as an "emancipation day." The mine workers were leaving them and were not easy to satisfy. Work, for lack of railroad cars, was not steady, and the price of coal, being fixed at a time of fierce competition, was not remunerative. The price of materials was also a heavy burden to carry. One coal company on the Norfolk & Western Ry. recently duplicated a tipple. The original tipple, built a few years ago, cost $60,000; the duplicate tipple, $175,000. The old power house cost $8300 and the new one $18,500, though the new building was the exact facsimile of the old one. The operators, not without some justice, have claimed that profits have not been so large as the mine workers have urged.

The mines in the Pomeroy Bend of the Ohio that were on strike have resumed work. Pressure was brought to bear on the men by the state and international officials, who had at no time authorized the suspension. The mines affected were the Charter Oak of the Peacock Coal Co., the Essex mine and the operation of the Pittsburgh Mining Co.

Missouri Operators Close Down Their Mines

In Missouri the operators have closed down the mines to discipline the mine workers for the Kirksville strikes, which were in violation of the contract. These strikes were to compel the discharge of a mine foreman at one of the mines. Five thousand mine workers are idle.

The strike in the steam-shovel pits in Kansas now involves six shovels, two more shovels having been laid idle during recently. The strip-pit workers, disregarding their agreement, want double pay instead of time-and-a-half for overtime. At the request of the men opposed to a strike, a committee has been appointed to investigate the controversy. The trouble seems to arise rather from the agitation of Alexander Howat, the president of the district, than from any desire for excessive payment for overtime on the part of the employees.

The Victor-American Fuel Co., the second largest coal company in Colorado and New Mexico, has finally conceded a contract to the United Mine Workers of America. The agreement was made Mar. 22 and became effective Mar. 26. The union and mine committees will be recognized, and the check-off will be collected by the company.

Refuse to Bond Themselves Not To Strike

The Canadian difficulties are becoming daily more acute. The mine workers wanted to discuss the wage scale before considering the working conditions, but the operators opposed that arrangement. The mine workers, however, did permit a discussion of the "penalty clause," hoping that when that was settled the operators would consent to discuss wages; but this hope proved vain. The operators desired the mine workers to put up a bond that would be forfeited in case of any strike, that might be proved violative of the contract provisions, but they could not get what they wanted. All they could secure was a renewal of the old penalty clause, which is not worth the paper on which it is written.

The operators wanted the mine workers to place the whole issue in the hands of an independent committee appointed by the Government, but the miners did not want a decision in which they had no hand. It is quite doubtful whether an agreement so secured would be any good when obtained. As the mine workers have twice bolted their own instrument, they would probably pay little attention to the award of a third party if it did not please them.

It is said that the Minister of Labor, T. W. Crothers, has hinted that if the mine workers and operators still continue to disagree, the Dominion will assume control of the mines.

On Apr. 3 more than 1300 men were on strike at Michel, Hillcrest, Bellevue, Chinook and Drumheller. The contract expired on Mar. 31, and the men refused to work any longer.

Neill's Decision Regarding Contracts

We wish to correct a misapprehension which it appears has arisen regarding a statement in our issue of Feb. 3 in reference to one of the decisions of umpire C. P. Neill, that decision being known as "Contract Miners versus D. L. & W. Co. Grievance No. 384."

After showing that the decision Dr. Neill made was contrary to the contract as we saw it, we added prophetically that, "The operators' representatives on the Conciliation Board will be careful hereafter in the umpires they allow to be chosen." As a matter of fact the appointment of the umpire is, by the decision of the Anthracite Strike Commission, left to a judge of the circuit court and not to the representatives of the operators and the miners on the Conciliation Board.

We are informed on good authority that the operators have no disposition to criticise or dissent from the decision of Dr. Neill in this or any other case. On the other hand, as in all cases since the formation of the Conciliation Board, they have scrupulously refrained from criticism of decisions that were adverse to themselves and have with loyalty to the spirit in which the Conciliation Board was constituted sought to conform heartily and conscientiously to its decisions.

It is only fair to say that in making its criticisms of the decision relative to contracting "Coal Age" was arguing entirely on the basis of the contract and the known facts, unbiased by any representations of the operators, with whom we did not in any case communicate. It was obvious that the United Mine Workers were as much surprised at the decision as "Coal Age."

They declared there was a private understanding with the operators conceding the abolition of the contract system. Evidently, then, the wording of the contract could not have assured such abolition, or a private understanding would not have been needed. Moreover, it was said in the Mine Workers' "Journal," "At that time [when the contract was made] the operators, while saying they would use their influence to abolish the contract system, except where it applied to machine mining, refused to put the assurance in writing." Evidently the mine workers do not claim even a private understanding as to machine-mining contracts, yet Umpire Neill conceded that it was involved in the contract.

We are amazed at the way in which he could justify his conclusion, but if the operators are satisfied actually, or merely as loyal adherents of the Conciliation Board, there is no cause to say anything further. It is but just to add that many of Dr. Neill's decisions have shown both fairness and acuteness of vision.

Canadian Labor Leaders Divided on Industrial Disputes Act

Ben M. Selekman, of the division of industrial studies of the Russell Sage Foundation, has made a careful inquiry into the Canadian Industrial Disputes Act, and the report appears in the New York "Survey" of Mar. 31, 1917. Unfortunately, it will have to be severely mutilated if it is to be kept within available limits in these columns. The remarks here republished have reference to its effect on industry in general. Its specific application to mining will appear later.

Comment in the United States on the Canadian industrial disputes investigation act within the last six months has been at once abundant and diverse. "The wisest and most successful labor legislation anywhere adopted," Charles W. Eliot wrote of it. "A false step, reactionary, un-American," is the verdict of Samuel Gompers on its application to this country. These two remarks typify the discussion that has been going on since President Wilson first recommended to Congress that it pass an act similar in principle to the Canadian law.

The object of this article is to analyze the Canadian law and examine the claim made for it and to give in some detail the facts as to its actual success in operation.

Law as It Is Written in the Statue Books

Under the law in question, which was enacted in 1907, it is illegal to declare a strike or lockout in mines or other public utilities until a full investigation into the merits of the dispute has been completed. Thirty days' notice must be given of any intention on the part of either employer or workers to secure a change in wages or working conditions. If at the end of this period no agreement has been reached, application must be made for a board of investigation and conciliation. The minister of labor then arranges for the creation of such a board, one member of which is nominated by the employers, one by the employees and a third by joint recommendation of the other two members.

This board considers the facts of the case in dispute and makes its report to the minister of labor. After that, employers and employees are free to accept or reject the recommendations and to resort to a strike or lockout. Penalties are provided ranging from $10 to $50 a day for each man, if employees strike, and from $100 to $1000 a day if employers lock out their workers, without asking for a board or without waiting for its decision.

After Nine Years Workmen Are Still Divided

For nine years this law has been operating in Canada. What is thought of it there is more significant, therefore, than what people say about it in the United States. Does the law force men into "compulsory servitude"? Has it established industrial peace?

In the dominion, as in the United States, opinion is divided. As in this country, public officials and employers are lined up in favor of the act; but, contrary to the status of opinion in this country, organized labor is not unanimous in condemning it; nor do those groups of workers in Canada who criticize the act, follow the same line of argument as their fellow workers in this country.

Interested citizens with hardly any exception approve the law, while the degree of public approval accorded the act can be measured effectively by the attitude of political parties. The Liberal Party is responsible for its existence, but the Conservative Party, now in power, has declared, through the minister of labor, that it will not repeal the law in spite of some objection from organized labor. It intends, rather, to amend and perfect it in order to insure more equitable and effective operation.

Disputes Act Has Some Enthusiastic Backers

Executives of public-utility companies reinforce the general argument of public men with their own first-hand experiences. "The act is all right," declared a representative of the Shipping Federation of Canada, "because it prevents hasty action."

Mining operators, on the other hand, while commending its principle, complain that the act does not work equitably for them, because the penal clauses cannot be enforced against their employees when the latter violate the law.

So far as labor is concerned, the Canadian Federation of Labor has gone definitely on record as not only approving the law but favoring an extension of its provisions. At its last convention a resolution was adopted favoring compulsory awards. This body is, however, a small organization; its membership consists of about 7000. The international unions, on the other hand—those affiliated with labor organizations in this country—number over 100,000 wage earners. We must look to the body representing these unions, the Trades and Labor Congress, which is affiliated with and corresponds to the American Federation of Labor and to the railway unions, for a more representative body of opinion.

Apparently Judgment Rests on Personal Experiences

The maintenance-of-way employees and railroad telegraphers, who both singly and jointly have had the greatest experience with the act, are most enthusiastic proponents of it. So much are they in favor of it that, in 1912, they severed their affiliation with the Trades and Labor Congress because, in 1911, the latter went on record as desiring its repeal.

At the Atlanta convention of the American Federation of Labor, the delegates of the Order of Maintenance-of-Way Men introduced a resolution asking that similar legislation be passed by the Senate and Congress of the United States; and the opinion of their membership is said to be still unchanged.

A prominent Canadian official of the Order of Railroad Telegraphers has spoken in the same vein; and the Brotherhood of Locomotive Firemen and Enginemen in Canada is also friendly to the principle of the act, but desires some changes in it.

The Brotherhood of Locomotive Engineers, on the other hand, is a most bitter opponent of the act. Its legislative board expressed itself in no unmistakable language last November in this resolution: "That this board do all in its power to have the industrial disputes investigation act wiped off the statute books."

The Trades and Labor Congress, which includes within its membership the other craftsmen coming within the scope of the act, such as miners, machinists and shopmen employed on railways, street-car employees and longshoremen, also adopted an unfavorable resolution at its convention last November: "That we go on record as opposing the Lemieux [disputes] act in its entirety." This is a change from the original attitude of this body. When the act was first introduced in Parliament, it had the indorsement of the president of the congress, who was a member of Parliament, and in the convention of that year the principle of the bill was indorsed by a vote of 81 to 19. In every year following 1907 until 1911, amendments were asked for to improve the administration of the law. In 1911, for the first time, the organization went on record as desiring its repeal, by adopting the following resolution unanimously:

While this congress still believes in the principle of investigation and conciliation and while recognizing that benefits have accrued at times to bodies of workmen under the operation of the Lemieux [disputes] act, yet in view of decisions and rulings and delays of the Department of Labor in connection with the administration of the act, and in consequence of judicial decisions like that of Judge Townsend, in the province of Nova Scotia, determining that feeding a starving man on strike [that is, giving strike benefits] contrary to the act, is an offense under the act: Be it resolved, that this congress ask for the repeal of the act.

Think Administration, Not Law, Is At Fault

In 1912 the resolution adopted in the previous year was repeated by the labor congress. In 1913, 1914 and 1915, the congress modified its position and went on record as desiring amendments, but in 1916, after long and heated discussion, they asked again for the repeal of the law.

One prominent union official, in explaining the last action of this body, remarked:

The principle of the act is all right, but you can boil it all down to a question of administration. The minister of labor has refused to establish boards in one or two cases and that has made the men feel that he is not administering the law in their favor.

A prominent representative of organized labor, also referring to the resolution, wrote:

The delegates were so worked up over their grievances that they were in no mood to distinguish between the principle of the act and its administration.

The extent to which this is true can be inferred from the fact that the delegates rejected, without calm consideration or criticism, the measure drafted by their own solicitor as a substitute for the present one, in order to meet the objections previously raised by them.

Do Not Like the Government's Third Party

Representatives of this organization, together with members of the railway labor unions, complain about the difficulty of securing a report favorable to labor. An official of the Machinists Union said:

The very personnel of the boards are against the interests of the workers. The chairman casts the deciding vote on these boards. In ninety-nine out of one hundred cases, the two members appointed by the employer and the men cannot agree upon a mutually suitable person. The minister of labor has to choose him, and he usually selects a judge or some professional man whose point of view is capitalistic and who has no sympathy for the working class. As a result, from the very beginning the chances are against getting a favorable decision for the workers. The chairman almost invariably lines up with the representative of the employer.

It is interesting and significant that hardly any of the Canadian trade unionists advance the argument heard in this country against President Wilson's measure—that such a law means compulsory servitude for the wage earners. On the contrary, most of them approve of the principle of the law, and direct their criticism purely against administrative defects. Their objections are chiefly that the minister of labor has refused to appoint a board on one or two occasions upon the application of a local union; that delays have often characterized the appointment and the hearings of the boards; and that it is difficult for them to secure a favorable decision.

Indiana Washroom Law Interpreted—The provision of the Indiana Miners' Washroom Law that an operator shall not be required to furnish soap or towels impliedly binds him to furnish all other things essential to the equipment and maintenance of the washroom. (Indiana Supreme Court, Princeton Coal Co. vs. Fettinger, 114 Northeastern Reporter, 406.)

Employment of Minors in West Virginia—The law enacted in West Virginia in 1907, forbidding the employment of boys under 14 years of age "in any coal mine," does not forbid employment of such a minor on the outside of a mine. Even when a minor has been employed below a statutory age limit, the father cannot recover damages for his death on the theory of violation of the law, if he consented to or acquiesced in the employment. (West Virginia Supreme Court of Appeals, Daniels vs. Thacker Fuel Co., 90 Southeastern Reporter, 840.)

An Example in Precise Surveying*

SYNOPSIS—The accompanying article will give a solution to many of the problems that arise in doing the surveying work for an accurate underground connection. The tunnel was 3½ miles long and straight throughout its entire course.

The Strawberry tunnel, constructed by the United States Reclamation Service in connection with the storage works of the Strawberry Valley Irrigation Project, is located under the rim of the Great Basin, in Utah and Wasatch Counties, near Provo, Utah. The tunnel is about 3½ mi. long and is straight for its entire length. The finished section is 7 ft. wide by 8 ft. 6 in. high, with an arched top. About 3 mi. of the tunnel was driven from the lower or west portal, and ½ mi. from the upper or east portal. As Project Engineer, J. L. Lytel was in charge of the construction of the tunnel, while the engineering work was in direct charge of F. W. Cater, Assistant Engineer. Several other engineers, of whom the writer was one, were employed from time to time on the routine engineering work.

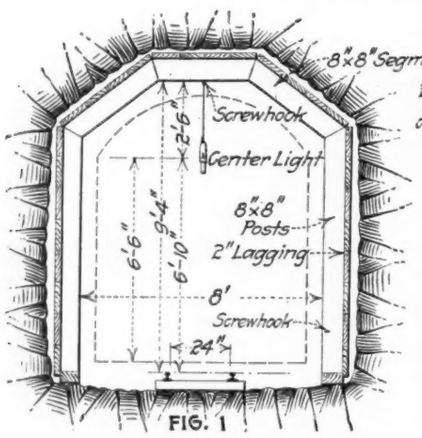
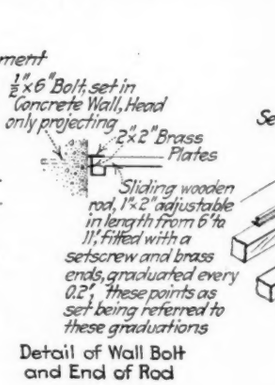


FIG. 1


1"x6" Bolt, set in Concrete Wall, Head only projecting
2"x2" Brass Plates
Sliding wooden rod, 1"x2" adjustable in length from 6' to 11', fitted with a setscrew and brass ends, graduated every 0.2', these points as set being referred to these graduations
Detail of Wall Bolt and End of Rod

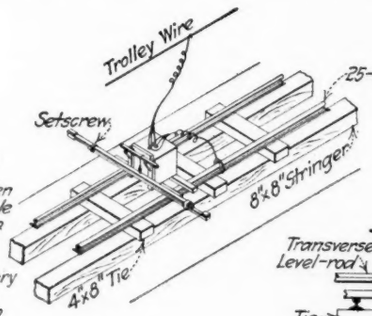
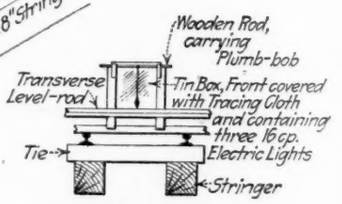


FIG. 2


Wooden Rod, carrying Plumb-bob
Transverse Level-rod
Tin Box, Front covered with Tracing Cloth and containing three 16 cp. Electric Lights
Tie
Stringer
FIG. 3

FIGS. 1 TO 3. SPECIAL SCHEMES IN STRAWBERRY TUNNEL SURVEY
Fig. 1—Sketch of location of construction-line points. Fig. 2—Arrangement for reading exact alignment on transverse level-rod. Fig. 3—Light-box

The profile of the ground surface along the tunnel line was such that only two intermediate set-ups were necessary between the two portals. Four large concrete monuments were therefore placed along the tunnel line, one just beyond each portal and one at each of the two intermediate points. The exact location of the line on these monuments was checked from time to time and was finally decided upon some time before the work was started at the east portal. Two independent "double rodded" level lines were run along the wagon road between the two portals, a distance of about 7 mi.; and as these checked by less than 0.10 ft., which was close enough for construction purposes, no further work was deemed necessary. The distance along the line (about 3½ mi.) was determined with a slope board. Two independent measurements gave results differing by less than a foot, and so it was not thought necessary to determine the length by triangulation. This work was done by the resident or assistant engineer in charge and one or two rodmen, as necessary.

The construction line in the tunnel was carried on screw hooks placed on the center line of the tunnel, either on wooden plugs driven into holes drilled in the roof, or on timber sets where convenient. These screw hooks were placed 50 ft. apart throughout the tunnel, and a new one was placed whenever the last one became 125 ft. from the heading. In order to facilitate the handling of muck-cars in the heading a section of double track, about 200 ft. long and with a switch at either end, was kept as close to the heading as possible. Hooks to be used as set-up points were set with special care at a point approximately in the center of this section. By setting the transit up in this particular spot it was possible to move empty muck-cars from a point ahead of the transit to the heading and back, leaving them (when loaded) on the other track, but still ahead of the transit. In this manner, construction work was not in any way interfered with, which is perhaps the most important feature of tunnel surveying.

A plumb-bob suspended from the previous set-up point and illuminated by electric lights if convenient, and by candles if not, served as a backsight, so that only two men were required for this work, one at the instrument and the other at the foresight. When the screw hooks were placed in plugs in the roof, there was practically no danger of their shifting; but when placed on timber sets, they had to be checked constantly, and it was customary after taking a backsight to check on one or two intermediate hooks before setting the new point ahead.

After the center screw hook had been set, levels were run, the elevation of the bottom of the hook determined and a grade hook set opposite the center hook and 1 ft. above true grade. This latter was to assist in laying track and placing timber sets. For the leveling, any convenient hook was used as a backsight, and for reasons explained above a sight was always taken on at least one other hook. In using overhead benchmarks it was of course necessary to use the level-rod inverted and to subtract backsights and add foresights.

The location of the center lights and their relation to the screw hooks and the neat lines of the tunnel, are shown in Fig. 1. The elevation of the screw hook once determined, it was an easy matter to adjust the length

*By L. M. Hammond, Assistant Engineer, United States Reclamation Service, Provo, Utah, in Engineering News, Dec. 7, 1916.

of the wire holding the center light (a candle stuck in a bushing) so as to bring the flame of the candle to the springing line of the arch. There were two of these center lights, one for each of the last two center hooks set. To avoid confusion a metal tag was kept fastened to the head light. This system of center lights was devised to give the shift boss or superintendent line and grade without the necessity of calling on the engineer at any time of day or night that he saw fit; and it made it necessary for the engineers to go into the tunnel only whenever a new center hook was necessary—at every 50-ft. progress of the tunnel, or approximately every third day. By hanging the two lights on their respective hooks the shift boss had a "line of sight" that would give both line and grade, sufficiently accurate for his purposes, at the face of the tunnel (or any other point) at any time. Having one fixed point, it was easy for him to "spot" the locations of the various holes to be drilled.

Control Line and Grade in Tunnel

Permanent benchmarks (for levels) were placed at various points in the tunnel, and the elevations of the construction points in the heading were checked up from one of these benchmarks at least once a month (from 300 to 500 lin.ft.). The elevations of the benchmarks were checked up occasionally from the portal benchmark. A 22-in. Gurley Y-level was used for all work, and sights were limited to 200 ft. and kept equal. While this instrument was somewhat heavy and cumbersome for tunnel work, the increased accuracy and its ability to hold its adjustments under somewhat trying conditions compensated for the inconveniences.

The apparatus used in checking the line is shown in detail in Fig. 2. For the first 2 mi. of tunnel, concrete monuments were placed at 1,000 ft. intervals along the floor of the tunnel and the line carried on them. At that point, however, a 7-sec.-ft. flow of water was encountered in the heading, which covered the floor of the tunnel with a foot or more of water and rendered useless all the carefully determined and preserved monuments up to that point. An entirely new system of marks was then determined upon and the line rerun several times.

Bolts were set in the concrete wall of the tunnel (or in the rock wall, if the tunnel had not yet been lined) about 1 ft. above the level of the water, with only their heads projecting. Three adjustable wooden rods were then made. The ends were capped with brass and had a small projecting brass lip (as shown), so that the ends of the rods could be made to rest upon and butt against the bolts on either side of the tunnel. The point was then determined on the rod. The rods were graduated to the nearest 0.2 ft., and the points as set were recorded as being so far to the north or south of any one graduation. It was thus an easy matter to take a numerical average of the location of the various shots. The rods were numbered, and the same rod was always used at any particular station. The point as finally determined was marked on the rod, and its location was carefully noted, so that it could be restored if obliterated. As temperature and humidity were practically constant, expansion and contraction were negligible; and it was possible for a point, once determined, to be relocated in practically exactly the same place at any future time.

These "benchmarks" were located at 1,000-ft. intervals (there were 16 between the west portal and the point where the headings met). The foresight was always kept at 1,000 ft., and the backsight was varied between 1,000 ft. and 5,000 ft. according to conditions.

The greatest difficulty, of course, was in getting the line started into the tunnel. In order to avoid heat waves and condensation of moisture, it was necessary to select a time when the temperature inside and outside the tunnel was about the same, but even with the best of conditions it was necessary to take more than 100 shots on each of the first two points in the tunnel before results satisfactory to the observers were obtained. Once inside the tunnel the work was much easier, and from 8 to 24 shots were usually sufficient to determine a point with a fair degree of accuracy.

One of the hardest tasks connected with the engineering on any construction feature, and particularly on tunnel construction, where all the work is being carried on in a very narrow space, is to do the engineering in such a manner and at such times as to cause the least delay and inconvenience to the construction. The superintendent is almost always intolerant of delays, and it is hard to convince him that the engineers have difficulties as well as he. In this case the engineering work was done with practically no delay whatever to the construction work.

Inasmuch as the driving of the tunnel was carried on with three shifts, a great deal of time was lost in disturbing and readjusting the instrument and sights to allow the muck trains to pass. The concreting gang worked only in the daytime; and so this engineering work was done at night, as it would have been absolutely impossible to dodge both muck and concrete trains and still do any work.

Light-Box and Instrument

The method of supporting and illuminating the plumb-bob is shown in Fig. 3. It will be noticed that the plumb-bob, its support and light are entirely independent of the rod on which is the "monument," being supported on the tramway tracks.

Six men were always used on this work, two each at backsight, instrument and foresight. The men at the instrument and foresight took turns with their work, while the extra man at the backsight acted as messenger whenever necessary. Owing to the fact that the work was done at night, in long shifts, in a very wet and comparatively cold place and in a tedious and painstaking manner, it was exceedingly fatiguing to all the members of the party.

The instrument used was a large Berger transit-theodolite. It gave excellent results and held its adjustments well. The instrument used in the construction work at the heading was a small Buff & Berger transit, which did very satisfactory work.

When the two headings met, it was found that there was an error in alignment of 0.18 ft., in grade of 0.13 ft. and in chaining of 2.5 ft. Considering the difficulties encountered and the fact that at no time was construction work interfered with, these results were considered satisfactory.

The methods and apparatus described are not exactly original with this tunnel, they being in some respects patterned after the methods used in the Gunnison tunnel, Colorado; neither can the changes and improvements be ascribed to any one man. They are an evolution rather than an invention.

Editorials

The Rapid Increase in Byproduct Recovery Installations

The coal industry is yet to awake to the possibilities presented by the recovery of byproducts in retort ovens. The opportunities afforded in this direction have scarcely been touched, though the extraordinary industrial activity of the country, and more particularly the exceptional demand from certain quarters for some of the coke-oven byproducts, has proved a potent stimulus to the industry. In fact, a review of the progress made during the past two years presents hopes that the industry is well on the way to coming into its own. During the past 24 months, byproduct recovery plants have more than doubled in this country, and the progressive coal man will do well to keep apace with the developments in this industry.

At the beginning of 1913 there were but 16 plants in the United States making light oil from coke-oven gas, while at the opening of the current year there were 40 benzol recovery plants operating in connection with byproduct coke ovens. Of these latter some are undoubtedly using benzol for enrichment, but the annual production of light oil is not less than 40,000,000 gal., while enlargements and new plants now in course of construction will bring this up to fully 50,000,000 gal. by the end of the year. The production of benzol in 1915 amounted to only about 22,000,000 gal. Even then it was twice that of the preceding year.

The extraordinary demand from munitions manufacturers for the benzol group of explosives has, of course, been an important factor in the great prosperity, and has created the impression that this is of a more or less temporary character. On the other hand, it must be remembered that the period succeeding the war will find a tendency among all countries to accumulate heavy reserves of munitions to which the trinitrotoluol product of benzol is peculiarly adaptable, owing to the fact that it can be stored indefinitely without deterioration. It will also find a large use in the chemical industries and more particularly as motor fuel. It is conservatively estimated that if benzol were recovered from all the coke manufactured in the country, the gross amount would be less than half of our exports of gasoline and naphtha alone in 1915.

The cost of operating a benzol recovery plant is comparatively small. The labor required for a plant with a capacity of 5000 gal. of light oil for 24 hours is as follows: Eight men, including three laborers on a day turn, three men at night and two chemists. Assuming the cost of the oven gas as nothing, which assumption is correct in view of the fact that no recovery would be effected without the installation of the byproduct plant, the cost of producing benzol varies between 4 and 7c. per gal. It will thus be very easy for benzol to compete with gasoline for automobile fuel purposes.

In gas-manufacturing plants it is interesting to review the exact loss occasioned by the extraction of the benzol. The actual loss in calorific value amounts to about 600 cu.ft. of gas, assuming that 1 ton of coal makes 11,000 cu.ft. of gas. Where used for steaming purposes, this fuel gas is worth about 6c. per 1000 cu.ft., so that the loss occasioned by the leaner grade of gas produced amounts to something less than 4c. per ton of coal coked.

In the manufacture of dyestuffs the United States is peculiarly backward. The German dye industry has a list of 40,000 varieties of colors, shades, tints and blends, while our manufacturers have limited themselves to a range of 150 colors. It is only fair to state in this connection, however, that the American manufacturers will find it hard going to compete with Europe. Germany, for instance, has made such tremendous advances along this line and has kept her processes so secret that American manufacturers will be compelled to make exhaustive basic researches to place themselves on an equal footing. On the other hand, the possibility of the enactment of a protective tariff will do much to encourage development. It is a significant fact that companies with an aggregate capital of $172,000,000 have been organized for the manufacture of dyes and chemicals since January, 1915.

It thus seems reasonable to believe that there is an unlimited market for byproducts. Future developments will undoubtedly tend toward overcoming the economic waste incident to using the benzol for enriching the gas. European practice is already substantially ahead of us in this respect, manufacturers there having adopted calorific standards instead of the old candlepower specifications, and having also largely replaced the flat flame burners with mantles.

Why Universal Military Training?

Every American boy, when he reaches the age of 18, under existing laws, automatically becomes subject to military duty. He remains subject to call until he reaches the age of 45 years. Training does not increase nor in any way change the liability that now exists. All it does is to better prepare the man to use his power more effectively and better safeguard himself.

Training is one thing; service is another. Under the Chamberlin Bill, all those who are physically fit must train, but no one can be called for service except for defensive warfare. The men trained cannot be used for strike duty. No one can provide a substitute. Bad characters must be trained separately. How can any American citizen, enjoying the advantages of this free country, oppose such a sane and sensible plan?

Here are ten reasons why universal military training is desirable:

1. It would apply alike to poor boy and rich boy, put both in the same tent, lead to a better understanding between them, make for a better democracy and eliminate caste and snobbery in America.

2. It would take the lad in his nineteenth year, when his earning power is small and before he has undertaken the marriage relationship and upbuild his physique, teach

him respect for his flag and make of him a trained defender of his country.

3. It would not put the boy into a regular, professional army, but would send him back into the paths of industry a stronger and broader character, and better prepared to fight the battles of civil life.

4. It would make the trained lad the chief protector of the nation and thus relieve husband and father, the mainstay of the family, of military service.

5. It would make the weak lad virile and the strong lad sympathetic and respectful.

6. It would be actually "universal," in that wealth could not purchase immunity and all mentally and physically fit would have to train.

7. It would create a new national morale and insure for the future stronger fathers, healthier men and women in the centuries to come.

8. It would be the antithesis of militarism, as under universal military training the defense of the country (except for the first line) would rest upon *trained citizens.* This would render a large standing army unnecessary and get entirely away from militarism.

9. It would revive patriotism in America—not the brass-band and parade-the-street sort—but real patriotism which says that inasmuch as all of us share alike the boon of freedom, likewise all of us shall share the nation's perils and responsibilities; all of us, in short, must so love our country as to train and be ever ready to defend her honor.

10. It would make America ready and therefore safe.

If you love your country, write immediately to the man who represents you in Congress and make sure that he knows *where you stand and what you want.* This is a time for action, not debate.

How Do You Use Your Faithful Men?

On Lincoln's Birthday a miner sat down and wrote us a letter of protest against his superintendent. His communication seems worthy of editorial notice, for mine foremen, superintendents and managers are always deploring the little support they get from their men and forget sometimes that they are themselves quite largely to blame.

The miner in question had been informed by the management that the mine would work. Consequently, he and his boy dressed themselves and went to their working places and waited till 8 a.m. for cars, only to be informed that as enough men had not presented themselves those who had been willing to work had decided to go home.

In going to their daily labor, in the winter, miners have not a few inconveniences to meet. They rise early in a cold house and travel a long distance through the bleak air in the semi-darkness. Even when they return without having accomplished anything, it takes considerable work to clean up and become presentable.

The miner who wrote to us after his cold trip was not in the best of humor when he left the mine. He was somewhat naturally prepared to blame everyone, rightly or wrongly, for his wasted effort. We do not always have a just sense of values when we are disappointed. When we rise at 5 a.m. to accommodate someone, for a hunting trip perhaps, and find he cannot fulfill his part of the bargain, we have some animus against him even though we realize he is victimized as well as ourselves. The miner had lost 3 or 4 hours of his day for which he would not get paid. Besides, he had wasted his time, which is a somewhat annoying circumstance to an industrious man.

Unfortunately, just as the party of four—the miner and his boy and another similarly unfortunate miner and his boy—were coming out of the drift mouth, they met the superintendent of the colliery. The latter, also, was grouchy because the mine was not working, and he snapped out, "Where are you going?" The reply was: "Going home, like the rest of the fellows. It seemed as if we were not going to get any coal pulled. Besides, we don't want the other fellows to be growling about our working when the union declares for an idle day. We worked on New Year's Day and lost out on it, and now the union threatens to fine us."

The superintendent then replied that the man had not paid any fine yet, the miner countering with the statement that he didn't expect to but that he "disliked the unpleasantness just the same." The superintendent, wrong from the first, added to his mistake by saying, "Why did you turn out if you didn't intend to work?" The miner warmly replied: "I don't aim to turn out when there's no work to do. I was willing to work if there was any one to give me cars."

Though he must have realized that the union and not the miner was to blame for the idleness of his mine, the superintendent still wanted to vent his spleen, so he came back at the miner in the absence of the union: "Why don't you go to the meetings of your local and do your part to make them resolve to work whenever you are willing to mine coal?"

The miner responded by calling attention to the fact that he lived over two miles from the meeting place and that he had served about three years already on a mine committee. He said he felt somewhat indifferent to attending meetings. The superintendent, still bound to blame the miner, replied: "You'd better go to meetings and talk; you talk enough here anyhow. You see where I'm placed. I got out my drivers to give you a day's work. I have to pay them and get nothing for it."

The miner in writing admits that the superintendent had a just cause for disappointment and anger, but not with him. His action tended to make enemies of the four persons who stuck by him longer than any others when the rest had deserted him. The miner informs us that he ceased attendance at the union because of tales which had been carried to the superintendent about his action at such meetings.

An attitude such as the superintendent showed is only too common. The man in control of a mine needs all his good judgment on the days when his mine is made idle. The men he might justly scold are not near-by and cannot be admonished. He must beware of venting his spleen on the fellows who show by their presence the degree of their good will—the men to whom in a measure he owes an apology and some thanks. The superintendent would feel the same if he had gone to get work himself and then, after cooling his heels a while, had been compelled to leave—with abuse.

The men who succeed are those who visualize the needs, the troubles and the psychology of the other fellow, and have that rare gift wrongly termed "common sense." No superintendent should hold his troubles so close to his eye as to block out all the worries that afflict his employees.

Department of Human Interest

Pennsylvania's Part in National Accident Record

Not only the returns for the whole country made to the United States Bureau of Mines but those made for Pennsylvania to the Pennsylvania Department of Mines show a reduction in fatal accidents in coal mines for 1916 over the number recorded for 1915.

The figures reported by the Federal Bureau of Mines for the whole United States show that 2269 lives were lost during 1915, while in 1916 the number was 2225. Thus there were 44 less fatalities last year than the year before. The records of the Pennsylvania Department of Mines for 1915 show that 1030 mine workers lost their lives, while in 1916 the number was 989, a reduction of 41. Of the net decrease of 44 accidents in the United States, therefore, 41 is to be credited to the precautionary measures taken in the State of Pennsylvania.

In the United States the net decrease in 1916 from falls of roof and coal was 14 fatalities, while in Pennsylvania the decrease was 72. The decrease by explosions of gas and dust in the United States was 78, and in Pennsylvania there was an increase of 17. The number of persons killed by explosives in the United States decreased by 9, and in Pennsylvania the number killed from this cause increased by the same amount.

RECORD OF COAL-MINING FATALITIES IN PENNSYLVANIA, 1916

Causes of Fatalities	Anthracite, 1915	Bituminous, 1915	All Mines	Anthracite, 1916	Bituminous, 1916	All Mines	Difference
Inside							
Falls of coal, slate and roof	268	245	513	216	225	441	—72
Cars	81	76	157	64	89	153	— 4
Explosions of gas	33	30	63	44	36	80	+17
Powder and dynamite	8	4	12	15	6	21	+ 9
Blasts	69	5	74	66	4	70	— 4
Falling into shafts	12	8	20	4	9	13	— 7
Falling into slopes	..	..	..	7	..	7	+ 7
Mules	1	..	1	4	3	7	+ 6
Machinery	1	4	5	..	7	7	+ 2
Electricity	4	23	27	10	22	32	+ 5
Miscellaneous	50	12	62	61	11	72	+10
Total	527	407	934	491	412	903	—31
Outside							
Cars	28	14	42	27	12	39	— 3
Machinery	10	4	14	16	1	17	+ 3
Boiler explosions	2	...	2	...	...	...	— 2
Electricity	1	4	5	1	1	2	— 3
Miscellaneous	20	13	33	21	7	28	— 5
Total	61	35	96	65	21	86	—10
Grand total	588	442	1,030	556	433	989	—41

Fatalities by coal-mine cars in Pennsylvania decreased by 4, accidents by explosions of blasts by an equal amount, and accidents from miscellaneous causes by 10. The fatalities caused by machinery increased by 2, those due to electricity by 5, and those caused by animals by 6.

Surface accidents in the United States decreased by 12, and of this reduction 10 may be credited to Pennsylvania.

The year 1916 in Pennsylvania was marred by five explosions of gas and dust—three in the anthracite region, by which 17 lives were lost, and two in the bituminous region, by which 35 persons were killed.

It is estimated that the production of coal in the United States for 1916 was 597,000,000 short tons as compared with 531,619,487 short tons in 1915, and that the number of short tons mined per fatality in the United States during this period is 269,000 as compared with 234,297 in 1915 and 209,261 in 1914.

The production of bituminous coal in Pennsylvania for 1916 was 169,123,811 short tons, so the production per fatality would be 390,586 short tons, which is the best record ever obtained in the bituminous region of Pennsylvania, passing the high-water marks of 375,248 tons in 1888 and 364,168 in 1897. The anthracite industry is an industry so different from that of bituminous coal mining that it is only fair to compare the record of the bituminous mines of Pennsylvania with that of all the other mines mining coal throughout the United States.

The great reduction in fatalities in Pennsylvania during 1916 was due to the decrease in the number killed by falls of coal, slate and roof, which decrease numbered 72. This has been largely due to the efforts of the Department of Mines. As 56 per cent. of the fatalities come from this cause, its importance has made the department most active in combating such accidents. The workers also have been more vigilant in protecting themselves from falls.

How Mine Workers May Get Hurt

In the issue of March, the *Anode,* published by the Anaconda Copper Mining Co., gives an account of some accidents from which coal-mining men might take heed.

Several men have been burned by bringing a light close to the refuse carbide dumped from acetylene lamps. The men were burned by the explosion of gas escaping from the unspent carbide waste.

A miner hoisting timber stood at the bottom of the timber slide. The rope broke and the miner received a compound fracture of the leg.

A miner accidentally got some carbide inside his underwear. He received a bad burn when he got wet.

Two miners lost their lives working in chutes without first making themselves safe above.

A machinist chipping steel nearly lost an eye from flying metal. Better to wear goggles than to be blind.

T. F. Reilly, in the same issue, gives some good hints for mule skinners.

Don't attempt to ride a loaded trip without making a safe place to sit; a sudden lurch of the car may throw you off.

Once the trip is started, don't look back until you bring the mule to a stop. Looking backward while the trip is in motion may cause you to be knocked off the trip by a chute mouth, or low cap.

Don't ride the tail chain, or door end of a car.

Don't haul powder or caps to the magazine; use a truck or car, and push them in by hand.

Have an understanding with men who are trucking along the roadway, so as to avoid the danger of a collision.

Ride your trip in such a manner that you will be able to cut off the mule at the least sign of danger.

Don't beat or excite your mule; gain his confidence, and he will do all he can.

Men passing a horse or mule in an entry should attract the beast's attention by speaking gently to him, and should walk easily by him.

Consolidation Coal Co. Fits Up a Rescue Department—At the Jefferson St. laboratory, Fairmont, W. Va., the Consolidation Coal Co. has installed equipment for a complete mine-rescue department, which will be in charge of company chemists

Discussion by Readers

Ignition of Gas by Electric Lamps

Letter No. 1—Kindly allow me to draw attention to what seems to me an apparent omission of an important fact, in the reply to the inquiry of "Mine Foreman," *Coal Age*, Mar. 31, p. 574.

The answer to this inquiry refers to the tests made by the Federal Bureau of Mines and published in their Bulletin 52. The reply given refers only to "standard incandescent lamps" and would seem to be incomplete, since it does not answer the question with regard to portable lamps, such as the miners hang on their caps or carry about with them in the mine.

All approved portable electric lamps, for mine use, are now equipped with a safety device that operates automatically to break the current the instant the globe of the lamp is broken. This device has withstood the severest tests of the Bureau of Mines and has been approved by the bureau. In these tests not a single ignition of gas took place.

Technical Paper 75, issued by the Bureau of Mines and entitled "Permissible Electric Lamps for Miners," describes the tests made on different types of portable electric lamps to determine the effectiveness of the device for breaking the circuit and preventing the ignition of gas when the bulb of the lamp is accidentally broken.

The results of the tests being satisfactory, the lamps were approved by the bureau for use in gaseous mines. I have drawn attention to this fact in order that no injustice might be done the portable electric lamp by the fact that it was not considered in the reply to the inquiry.

Portable electric lamps are referred to in Bulletin 52 as "miniature lamps," and are in a class by themselves, in respect to the voltage required to produce the light, their candlepower, and the equipment to which I have referred for preventing the ignition of gas should the bulb be broken. MANUFACTURER.

Springfield, Mass.

Overloading Mine Cars

Letter No. 1—My attention was recently attracted to an item given under "The Labor Situation," *Coal Age*, Jan. 27, p. 194. The item referred to a strike by the miners of the Logan Coal Co. and the Beaver Run Coal Co., at Beaverdale, Penn., and stated that these companies had granted the demands of their miners, asking for the abolition of the practice of not giving miners due credit for coal loaded over a certain standard weight.

It seems that it has been the custom with these companies to set a limit of 3000 lb., which was regarded as the "standard weight" of coal for their cars. A miner loading a car with 2500 lb. of coal received credit for that amount. But if the weight of the coal was, say 3500 lb., the miner received credit for only the standard weight of 3000 lb. and was compelled to lose the other 500 lb. in excess of the standard weight.

As far as my experience goes, in the Hocking Valley district, the overloading of mine cars has been discouraged by the operators declaring a height limit for the coal, rather than a weight limit. It has been quite generally claimed, and reasonably so, that the operator has no right to take any part of the weighed coal of a miner, but must give him full credit for the coal loaded in his cars.

It has been readily conceded, however, that the operator has a right to prevent the overloading of cars by miners. The men quite generally have acknowledged this and, with a few possible exceptions, have shown a willingness to comply with any regulations limiting the size of the loaded car, but claiming that they should receive credit for the full weight of the coal loaded.

Where the regulations, in this regard, have not been followed willingly by the men, the operators have been permitted to put up what is called a "raker," which would take off from a car any coal loaded in excess of the specified height above the rail.

I am glad to say, however, that it has seldom been necessary to consider this question, in the Hocking Valley district. The operators quite generally prefer to get all the coal that a car will hold. The cars are generally built to stand up under a maximum weight.

New Straitsville, Ohio. GEORGE N. LANTZ.

"Back to the Mines"

Letter No. 1—Recently there have appeared in *Coal Age* many letters relating to the shortage of labor in mines. It is said that many miners are deserting the mines, or have already left them, to seek employment in munition plants and powder mills. The wages offered were attractive and induced many to give up their occupation of mining coal for what seemed to them a more lucrative and less laborious calling.

The experience of the hosts of workers in these plants, however, has not justified these early expectations. When the demand for war material first started, labor to operate the plants had to be secured at any price, and big pay was offered to induce men engaged in other occupations to leave their places and engage in the work, with which they were wholly unfamiliar. The result was that many flocked to the newly started industries, which were thronged. Later, the wages in these plants were reduced, so that now the men scarcely average $5 a day.

While even this reduced rate of pay may seem big to some miners, they must bear in mind that the men in those plants work 10 hours a day, on piece work, and their earnings are wholly dependent on their skill and industry.

One of the toilers—a miner who six months ago left the mines to take up this work—said to me not long since, "Believe me, a man must work every minute to get a decent day's wage." He was ready and anxious to take up again his pick and drill and dig coal in the mine as before. Others have found that in the 5 or 6 hours they actually work in the mine they can make better

pay than could be earned by hard work in 10 hours in munition factories.

It is not strange, therefore, that many are hearing the call of the mines and hastening back to their old occupation, where they feel at home and contented.

In closing, I want to say, "Boys, stick to your room in the mine and you will be better off." I took a job with one of these plants, myself, at a time when the mine was idle, and shall be glad to be back again soon and working with the boys at the face. ANON.

Philadelphia, Penn.

Letter No. 2—Many valuable suggestions were made in the letters on "Shortage of Labor," which appeared recently in *Coal Age*. Among these, none is more true than the statement that "the better the working and living conditions in and about a mine, the more permanent and reliable will be the class of labor secured."

In this letter, I want to refer to that itinerant class of miners, representatives of which are to be found in almost every mining camp. They wander about the country, ostensibly in quest of work. They rarely abide long in a place, but are always on the go. The great majority of this class are natural "hoboes," inseparably associated with a physical inertia or "wanderlust."

Such ones never look for work until they are broke. They drop in suddenly on a mining camp, usually from a freight. In reply to the question of what they can do, they assert their willingness to accept any kind of work, but their first anxiety is the boarding house.

The hue and cry of these fly-by-night, would-be miners is always the difficulty they find in getting a good boarding place. The boarding house is usually an acute question in a mining camp, where many applicants are wholly unknown and generally broke. Naturally, there is much hesitation in taking to board a stranger who has only the clothes on his back.

In the present scarcity of labor in the mine, the lot of the itinerant miner is not so bad as when labor is more plentiful, but with the improvement in mining conditions, his lot is not an enviable one. There are instances where mine foremen have given these fellows store credit for their tools and stood good for them at the boarding house; but, too often, these acts of generous hospitality have not been rewarded by the faithfulness of the worker. We are hoping for the time to come soon when the cry will be heard of "Back to the mine," and a better class of miners will then be in evidence. W. H. NOONE.

Thomas, W. Va.

Mine-Accident Record

Letter No. 18—I feel it a duty to tell of two or three avoidable accidents that have occurred in my experience, all of which were the result of ignorance or carelessness.

Recently, an outside machinist was sent into the mine to repair a pump. To save time he rode in on the motor. Being unfamiliar with the low places on the haulage road, this being his first trip in the mine, and being unwarned, he was crushed to death between the motor and the roof of the mine. As a result of this accident, the mine foreman at once prohibited anyone riding on the motor; but it was like locking the stable door after the horse was stolen.

An accident that was due to pure carelessness occurred when a demonstrator attempted to show a miner how he could fire his shot by means of two dry-cell batteries. He attached one of the lead wires of a prepared shot to one pole of the battery. Then, taking the other lead wire in his hand, he said to the man, "When you are ready to fire a shot all you have to do is to touch this wire to the other pole of the battery, like this." Accidentally, he brought the wire in contact with the pole of the battery, and an explosion followed that killed one and badly injured the other.

Another accident that comes to my mind and which will be remembered by many who read this, was one that happened to two men who started to walk into the mine one morning, proceeding ahead of the trip that hauled the men to their work. Before reaching their working places, the trip overtook them. They ran into a refuge hole on the road where the latter made a sharp curve. The motor, which was running rapidly, was derailed at this point and the men were pinned in the hole by the motor and badly crippled.

The men riding on the trip were much shaken up but not seriously hurt. This accident was the result of reckless running on the part of the motorman, who should have approached the curve at less speed. Accidents from careless running of mine locomotives are of common occurrence everywhere and should be avoided by motormen using more caution.

A careless accident occurred recently in a mine where I was employed. A man had been using gasoline in the mine and his clothes had become saturated with it. After finishing his work, he approached a fire for the purpose of warming and drying himself. The gasoline on his clothes ignited and he was severely burned. It can hardly be supposed that the man was ignorant of the inflammable nature of gasoline, and we must conclude that he was thoughtless or careless. SAMUEL JONES.

Madera, Penn.

Reopening a Flooded Mine

Letter No. 1—It was with much interest that I read the inquiry of C. King Morelight, *Coal Age*, Mar. 24, p. 533, and I take it he is "seeking more light" on the proposition of reopening his mine. Like many other practical men when asking information, however, he has omitted to give some important data that would enable one to answer his inquiry more intelligently.

An inflow of 200 gal. per min. is a very fair quantity of water, and it is possible that its source is a single bed or stratum above the coal. In that case let me suggest that there would be much advantage in handling this water, in the later operation of the mine, by installing an adequate pumping station at that point in the shaft and preventing the water from flowing into the mine, by building a concrete ring completely surrounding the shaft. This would reduce the head under which the water must be pumped and require less power.

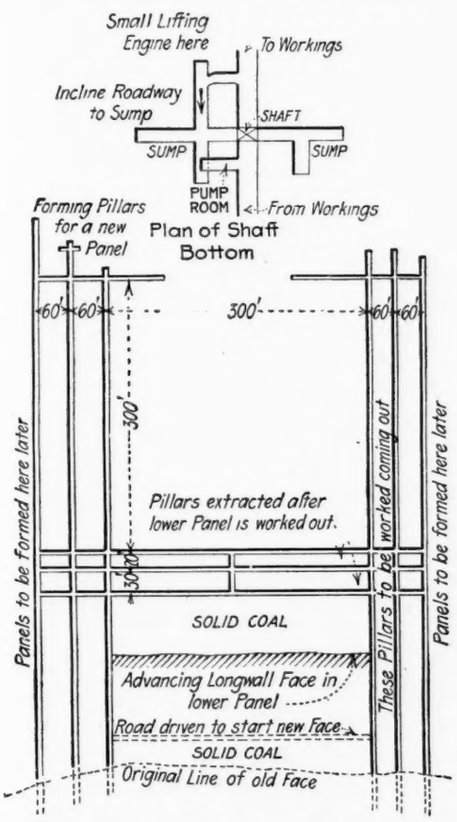
Again, it is important to know the location of the shaft in the leasehold, and whether the inclination of the seam is such that the water drains toward the shaft, as this will have an important bearing on the question of keeping the mine free from water during its later operation. Answering the questions in the order given, allow me to submit the following:

1. Expense will be saved by installing an electrical equipment suitable for the permanent plant. I would

prefer a turbine pump driven by electricity. This should be of such a size and type that it can be employed in the unwatering of the mine and utilized, later, as a unit of the permanent pumping plant.

2. The capacity of the pump required to handle this quantity of water must be determined by first deciding how much time will be consumed in pumping each 24 hours when the mine is in operation. A good plan would be to allow 12 hours for pumping each night, which would afford ample time for making any necessary repairs.

3. The sump must have at least a capacity equal to the inflow of water during the 12 hours the pump is idle, if



PROPOSED LONGWALL-PANEL SYSTEI

all the pumping is to be done in 12 hours out of the 24. This will require a cubic content of (200 × 60 × 12 × 231) ÷ 1728 = 19,250 cu.ft. Assuming it to be possible, I would prefer to make this sump by driving levels in the strata underlying the coal. If these levels are driven 6 ft. high and 12 ft. wide, the sectional area will be 96 sq.ft., and it will require a length of practically 200 ft. to give the required capacity, as stated above.

Before leaving the question of pumping, it is important to consider whether the development of the mine will not increase the inflow of water beyond the estimated amount. In that case there will be a greater sump capacity required, and it may be necessary to install another unit or two in the pumping station. It is important, also, to give the bottom of the sump such a grade that it will drain to the pumping basin, where the suction pipe is located. Also, arrangements must be made to enable the sump to be cleaned from time to time, as required.

4. The roof and floor of this seam being sandstone, the longwall method of mining appeals to me as the one most suitable, especially if the coal is mined with machines. It is possible that the caving of the face at regular intervals of 60 ft., in the previous working of the mine, was due to too tightly packing the waste, which would throw the weight of the overburden forward on the coal face.

The inquiry does not state whether the previous mining was by hand or machine. There is considerable difference in the application of these two methods to longwall, as the speed of advance of the working face is an important factor in the success of the operation. The lack of experienced longwall miners is the chief objection to the adoption of that method of mining.

Modified Longwall-Panel System

As shown in the accompanying figure, I would give the longwall method another trial; but, to guard against possible failure, I would arrange the work in panels. Each panel is to be worked out consecutively by a continuous longwall face. When laying out the panels, regard must be had to the cleats of the coal and the inclination of the seam. Longwall cutters can be used and a conveyor can be installed to advantage along the face.

7. It is obviously impossible to give an intelligent answer to the question of estimating the possible tonnage within six months after the mine has been unwatered. Assuming, however, that a longwall face has been opened out in one panel, giving a machine section 300 ft. in length, this should yield at least 100 tons a day. It may be necessary to double-shift the pillar workings in order to keep pace with the longwall work in the panels.

8. The method of starting a room-and-pillar or a panel system, such as I have suggested, from the old longwall face, is plainly indicated in the figure. A road is driven across the width of the panel, a few yards inside of the old longwall face, as indicated by the dotted line. The longwall face is then started on the inby rib of this road, which must be of sufficient width to enable the machine to work and give room for setting up the conveyor.

NOVA.

Montreal, Canada.

Arrangement of Room Tracks

Letter No. 1—The arangement of room tracks suggested in *Coal Age*, Mar. 10, p. 423, is well worth discussing to determine its particular advantages or disadvantages. Such an interchange of views is always a cheap means of securing a good practical education, as those who have followed the various discussions in *Coal Age* well know.

An arrangement somewhat similar to that described on page 423 was used in a mine where I was employed some time ago. The object in that case, however, was to reduce the number of switches on the haulage road rather than to effect a saving of steel rails, track ties and time, which were the advantages claimed.

In the case with which I am familiar, the tracks leading from one room to another were laid through the first crosscuts off the entry, which gave little opportunity to save track material but accomplished the desired object of reducing the number of switches on the road. This object appeals to me as the only one worthy of serious consideration, in studying the proposed arrangement.

The claim that much time would be saved by reason of the fact that the cars would be distributed between the three rooms served by a single road switch, from a point nearer the face of the rooms, is only true when the tracks are laid through crosscuts at some distance from the haulage road. In the case presented, this distance is indicated as 180 ft. In many instances, however, owing to roof conditions that would not permit of driving long rooms, the argument would not apply and there would result practically little saving of time.

When we consider the extra wear and tear on both motor and cars, in swinging around two extra sharp curves in order to reach the faces of the rooms on either side, we must acknowledge that the advantage gained in this arrangement is practically counterbalanced by the cost for repairs, to which must be added the cost of laying the extra switches and bending the rails for the curved tracks in each crosscut. There is also an increased risk of derailing cars on these curves, which would mean much loss of time and great annoyance.

Objection to Curved Rails

Speaking of curved rails, my experience is that when rails are once bent for a curve they are of little use for any other purpose, as the time spent in straightening them is a considerable item. Again, since few mines are equipped with steel ties, the cost of extra track spikes and wooden ties must be considered. Allow me to suggest, here, that greater advantage would arise in hauling out the coal from rooms 2 and 3 through room 1, than by the method suggested. This would obviate back-switching from room 2 to room 1.

There is another important consideration that must be taken into account, and that is the ventilation of the rooms. It is necessary to hang canvas on all crosscuts through which tracks are laid in order to prevent the air short-circuiting here and not reaching the faces of the rooms. This point was not mentioned in the article to which I have referred. Practical men will readily realize that these canvas doors are short-lived when hung on haulage roads where cars and motors are passing.

Taking everything into account, I cannot see that there is much advantage to be gained by the proposed arrangement, except in the fact that the number of switches on the haulage road is reduced, as I stated at the beginning of this letter. SPIKES.

Herrin, Ill.

Letter No. 2—My attention was drawn to the article by "Engineer," regarding room tracks, *Coal Age*, Mar. 10, p. 423. Having seen this system in use and in response to his request, I will mention its advantages briefly.

In my opinion, the chief advantage gained by serving three or more rooms from a single switch on the haulage road lies in the reducing of the number of switches on the road. The arrangement also saves time and trouble, both in mule and electric-locomotive haulage.

For example, when the locomotive is placing empties, instead of having to set one empty into each room, it pushes three empties into room No. 2 and, leaving them there, pulls out and pushes three more empties in room No. 5, and so on along the entry, setting three cars in each third room. In my judgment, this would save at least 50 per cent. of the time required for gathering and distributing cars.

It is frequently possible to serve more than three rooms from a single road switch. For instance, suppose there are five rooms far enough advanced to allow the switches to be moved forward and tracks to be laid through the crosscuts nearest to the faces of the rooms. The road switches are taken up at the mouths of four of these rooms and used in the crosscuts near the face.

Advantages and Disadvantages of the System

In this system, the locomotive does not have to travel the distance from the entry to the last crosscut in each room, but is able to set the cars and gather the loads from each working place by making a single trip from the entry to the inby crosscut.

When it is necessary to use a cable to allow the gathering locomotive to proceed up to the face there is a great saving also, in the wear on the cable, because the locomotive makes a single trip only, instead of entering the five rooms separately, and the cable is wound and unwound from the reel but once, in place of five times, as would be necessary in the other arrangement. Again, in electric haulage, an important consideration is the reduction in the amount of rail bonding required.

As far as I can see, the only disadvantage in the use of this system is the necessity of moving the switches, taking these from the road and laying them in the crosscuts. I consider this, however, a small item in comparison with the advantages gained. Just here, let me suggest another time-saver which occurs where rooms are turned off both entries of a pair. In that case, it is only necessary to maintain tracks in one of the entries, outby from the rooms that are working. A crossover switch and track are laid leading through the crosscut to enable the locomotive to haul the cars from the rooms on the back entry. As the work progresses and more rooms are abandoned, the switch can be moved forward two or three breakthroughs, and the track in the back entry outby from this point taken up.

In this system, the locomotive sets the empties in the rooms on one entry and, proceeding through the crossover, gathers the loads from the other entry and hauls them out of the mine. G. W. SUTHERLAND.

Blakeley, W. Va.

Making Up Cartridges in Mines

Letter No. 2—Referring to the suggestion of miners making up their cartridges at home, and carrying them into the mine, I want to say that if it was possible to obtain a full list of the fatalities that have resulted from miners keeping their powder at home I believe these would far exceed the number occurring in mines by reason of careless miners not putting their lamps aside when handling powder.

In the 12 years that I have been employed in the mines I have never heard of such an accident taking place. On the other hand, I have known of one or two serious accidents to occur where miners kept their powder at home. While I do not doubt the statements that have been made, it must be acknowledged that such accidents are the result of carelessness on the part of the miner. The keeping of powder at home is not only a menace to the neighborhood, but is a source of danger to the man's family and particularly to children who are always curious and seldom fail to find danger when it is about.

When a small boy I attended school just across the road from a miner's house. The man was a widower with three small children, two boys and a girl, their ages ranging from 6 to 12 years. When starting to work one day, the miner forgot to take his powder canister, which he had filled that morning. In cleaning up the house the oldest girl found the canister and attempted to set it up on the high mantelpiece above the grate, thinking that there it would be out of harm's way. It slipped from her hand, however, and fell into the grate. A violent explosion followed; the oldest boy was disfigured for life, and the two remaining children died that day.

Another Powder Accident in a Miner's Home

The second instance is that of a careful, experienced miner who kept his powder at home. He had a wife and a number of children, the youngest being a little girl. The two oldest boys worked in the mine with the father. Believing that the safest place to keep the powder was in the oldest boy's bedroom under the bed, there being no fire in that room, it was always kept in that place.

One morning, after the father and the boys had gone to the mine and the other children to school, the little girl wandered upstairs to her brother's room, while the mother was busy with her work. Seeing the dark can under the bed, the child pulled it out and, naturally, wanted to see what was in it. A bright thought struck her—she knew there were matches in her brother's coat pocket hanging on the wall. Climbing onto a chair she got a match from the pocket of the coat just as her mother called her to come downstairs. Instead of obeying at once, she hastily struck the match to peer into the keg. A portion of the burnt match dropped into the powder and, although, fortunately, there was little powder in the keg at the time, the explosion set fire to the bed and filled the house with smoke, but the child escaped.

Carrying Powder to Work a Public Menace

Another danger, in this connection, is that resulting from miners carrying their powder through the streets, riding on the cars and stopping to make purchases in stores. This is a real menace to the public and should be prohibited by law. I have observed many foreign miners who are guilty of this habit and do not recognize its danger.

In closing, let me say that it is my belief that if mine foremen, firebosses and shotfirers will do their whole duty in enforcing the mining laws and the regulations and rules of the mine, there will be fewer accidents arising from miners making up their cartridges in the mines.

Wellsburg, W. Va. Daniel F. Smith.

Letter No. 3—I read with interest the letter of James Potts, *Coal Age*, Mar. 17, p. 485, but my experience leads me to think that his suggestion that cartridges should be made outside of the mine and, particularly, at home cannot be carried out successfully in large mines.

Many of these mines are equipped with electricity, and the current is generally on when the men are going to work. In order to avoid the danger of the powder carried by the men being ignited by accidental contact with live wires, it would be necessary to have the powder canisters incased in some nonconducting material, and even this would not eliminate the danger wholly, owing to the careless manner in which miners handle their powder.

Some time ago I worked in a mine where the men were allowed to carry into the mine what powder they needed for the day. It was a new mine, and there were no electric wires underground. Mules were used to haul the coal, and it was customary for the men to come and go at any time that suited them best. Many of the men kept their powder at home and used it as they required.

Two accidents happened in close succession, in this camp, and the result was that the practice of carrying powder home was stopped. In one instance, a little five-year-old girl, in fun, tossed a hot coal into the open keg of powder from which her father was filling his canister—"just to see papa jump," the child explained later. The father was so badly burned that he died in a few hours.

The second instance was one in which a number of boys stole powder from their fathers' kegs to play mining. They had dug a hole in the side of a hill and expected to use the powder as they had been told their fathers did in the mine. The result was that some of the powder was ignited in the pockets of one of the boys and he was seriously burned. The lesson to be taught by these accidents is that no powder should be taken home, but should be kept in a suitable place in or about the mine.

Careless in the Mine, Careless at Home

Like Mr. Potts, I too read W. L. Morgan's account of the accidents that occurred in the mines, from men pouring powder into their caps when making up their cartridges, *Coal Age*, Jan. 27, p. 203. This was in violation of the mining law, and no prudent miner would have attempted such a thing. I want to say that a man who has so little regard for his own safety and that of his fellow workers as to commit such an act would be equally careless in his use of powder at home. All that is needed is care and judgment in the handling of explosives.

The cartridge stick described by Mr. Potts should always be used in making the cartridge case. A good quality of wrapping paper must be employed. The case should then be filled, using a funnel-shaped cartridge filler that can be bought for 10c. in the stores. When filled, the cartridge should be sealed with a small piece of laundry soap.

Speaking of storing powder in the mine calls to my mind an instance where the company compelled its men to keep all their surplus powder in a place that had been prepared especially for that purpose, by excavating a hole in the rib about halfway between two panels. This hole was fitted with a steel door provided with a good lock, and the company paid one of its reliable men for taking charge of the place and keeping the key.

In this powder hole, there was a place provided for each man to put his cartridge stick, paper, squibs and powder. No miners were permitted to take a light into the place, but a lantern was used instead. At first, the arrangement caused some grumbling, because the men had to walk to the place to get their powder and other supplies for blasting.

Each of these powder holes was examined by the mine foreman at least once a month and its condition reported to the general manager. Each week the man in charge of the key filled out a form, showing the number of kegs of powder used and on hand, at the same time reporting any observed violation of the rules. I believe no accident from the handling of powder has ever occurred in this mine, as a result of the care taken in its use.

Herrin, Ill. Ostel Bullock.

Inquiries of General Interest

Sampling a Cargo of Coal

Can you give me any information in regard to a tool that can be forced down through a boat load of coal and bring up a sample from the bottom of the load? Is there such a tool in use for that purpose, and where is it made? Any information you can give me will be greatly appreciated. HARDWARE.

Elizabeth, N. J.

We have no knowledge of a tool of the character described by this correspondent, and inquiry among large shippers of coal and fuel-testing companies convinces us that there is no such method in use of sampling a cargo of coal. The customary way of sampling a cargo of coal is to take a shovelful at regular intervals, as the coal is unloaded.

The only way of securing a sample from the bottom of a cargo of coal would be to use a regular mine drill, capable of bringing up a core, after the manner of prospecting, but this is quite impracticable.

The Sampling of Mine Air

Please explain, through the columns of *Coal Age,* the method employed by the Federal Bureau of Mines to sample mine air. In other words, what means do the engineers of the bureau adopt to collect samples in the workings of a mine when it is desired to obtain a sample of the air for analysis?

JOHN HAMMOND, Safety Inspector,
Colver, Penn. Ebensburg Coal Co.

The means employed in the collection of samples of mine air and gases for the purpose of analysis, by the engineers of the Bureau of Mines, were fully described in Bulletin 42, by George A. Burrell and Frank M. Seibert.

Sampling bottles having a capacity varying from $\frac{1}{4}$ liter to 3 liters were taken into the mine. These bottles were provided with stoppers coated with a thin layer of grease to insure an air-tight fit. A rubber tube and a small hand pump or syringe is used to suck the air from the bottle and allow the mine air or gases to fill the space vacated by the air withdrawn. One end of the rubber tube was dropped into the bottle and, by operating the pump or syringe, the air was withdrawn from the bottle and the space it occupied quickly filled with the air and gases to be analyzed.

In place of the hand pump or syringe a miniature fan actuated by a spring was used later and found to be very satisfactory as a means of withdrawing the air from the bottle. When this was done, the stopper was placed in the neck of the bottle and sealed with paraffin to insure the exclusion of air from the sample collected.

The old method of filling the bottle with water or other fluid to be displaced by pumping the mine air or gas into the bottle has not been used by the bureau, because of the possibility of the gases being absorbed by the water. The use of mercury as a displacing fluid was also found objectionable on account of its weight.

Wooden Mine Pumps

I would like to ask for information in regard to the use of wooden pumps in mines where the water is heavily charged with an acid that prohibits the use of metal pumps because of the corrosive action of the water on the metal.

We have to contend with a very difficult proposition in our No. 2 mine. Owing to the acid character of the mine water, the life of the suction line and different parts of the pump used for draining the water is a matter of a few days only. I want to ask if there is any record of wooden pumps having been used successfully in handling acid mine water. Will some of the readers of *Coal Age* kindly give their experience?

H. CLYDE ELKINS, Assistant Engineer,
Washington Coal and Coke Co.

Star Junction, Penn.

A few years ago, George Robson, of Murray, Hocking County, Ohio, invented a wooden pump that he claimed would successfully handle acid mine water with greater satisfaction than brass or bronze-lined pumps.

The pump was of the same general type as a horizontal, triplex, outside-packed plunger pump. Practically the only metal coming in contact with the water was the plunger. The cylinders, valve chests and valves were made of wood. Those parts that were subjected to pressure were thoroughly reinforced with metal on the outside. In order to prevent the valves from splitting, they were bound with metal, but this did not come in contact with the valve seats, so that the corrosive action of the water on the metal bands did not affect the efficiency of the pump.

A pump of this kind, we understand, was installed in an Ohio coal mine and gave good satisfaction for a period of 28 months. The expense for repairs during this period is said to have been only 85c. The pump had a capacity of 250 gal. per min. and was operated against a 600-ft. discharge head.

This pump replaced two bronze-lined cast-iron pumps that had failed after being in operation only two weeks. We shall be glad to hear from those who have had experience in the operation of wooden pumps for handling acid mine waters, or know where such a pump is made.

The United Iron Works Co., of Joplin, Mo., handles a pump that is built by a local concern and which is designed specially to handle acid mine water; it will furnish prices and full data on receipt of specifications of the requirements in any particular case.

Will readers of *Coal Age* who have had experience in the use of wooden mine pumps or have known of their use in mines give us the benefit of their observations?

Examination Questions

Bituminous Mine Inspector's Examination, March, 1917

(*Selected Questions*)

Ques.—(a) What are the legal duties of a mine inspector? (b) How would you proceed to make an inspection of a mine as mine inspector? (c) What reports are to be made of such inspection?

Ans.—(a) The duties of a mine inspector, as defined in Art. 19, Sec. 11, of the Bituminous Mine Law of Pennsylvania, are that he shall devote all his time to the duties of his office and thoroughly examine each mine in his district as often as possible, but at least once every four months, giving special attention to mines generating explosive gas, or where unusual dangers may be expected. He must see that all the provisions of the mining law are observed, especially those relating to conducting the air current to the working faces. He must keep a record of each examination made, showing the condition of the mine with respect to ventilation and drainage, the number of persons employed underground, the extent to which the mine complies with the requirements of the law, and the improvements made in its condition and equipment since the last visit. The record must also show all serious accidents and explain the nature and cause of each accident and the number of fatalities.

(b) Visit the mine without giving any previous notification and, as far as possible, at unexpected times. On arrival at the mine, note the speed of the ventilating fan and the general conditions about the mine; visit the engine room before descending the shaft, which should not long be delayed. On reaching the shaft bottom, observe closely the condition of affairs and proceed at once to those points of greatest interest.

In making the trip throughout the mine, observe carefully the condition of all roads and airways, and inspect each man's place, making particular note of the manner in which his coal is mined, the place timbered and the amount of timber on hand. Make it a point to talk freely with the men, and listen to whatever complaints they have to make in respect to the safety of the mine, the ventilation and other matters affecting the health of those working underground. The aim of the inspector should be to discover any violations of the mining law by the men or the mine officials in charge.

(c) The inspector must make a written report on a printed blank and post the same in the company's office or other conspicuous place, immediately after completing the examination of the mine, such report to show the date of the examination and condition of the mine. He must make a monthly report to the chief of the Department of Mines not later than the sixth of each month, giving the location of each mine inspected, the name of the operator, date of inspection, condition of mine and quantity of air in circulation. He must make an accident report to the department not later than the tenth of each month. His annual report to the department must be made not later than the twentieth of February each year, summarizing his work for that year.

Ques.—A rectangular collar 10 in. deep supports 1500 lb.; what will it support if its depth is increased to 12 in.?

Ans.—The load supported by a beam varies directly as the square of its depth, other things being equal. Hence, a 12-in. beam will support a greater load than a 10-in. beam, in proportion to the square of the depth of the beam. In other words, the load ratio is equal to the square of the depth ratio. Hence, calling the required load for the 12-in. beam x, we have

$$\frac{x}{1500} = \left(\frac{12}{10}\right)^2 = \left(\frac{6}{5}\right)^2 = \frac{36}{25} = 1.44$$

$$x = 1500 \times 1.44 = 2160 \text{ lb.}$$

Ques.—What one cause produces the most accidents in the mine, and what would you recommend to reduce accidents?

Ans.—The greatest number of accidents occur from falls of roof and coal. To reduce their number, constant supervision of all working places and greater discipline is required. The employment of safety inspectors in the mine, the education of miners and the adpotion of various safety rules and devices have done much to decrease the number of mine accidents.

Ques.—What precautions are necessary to safeguard the workmen where blasting is done in a dusty mine generating explosive gas?

Ans.—Miners should not be permitted to fire or even prepare their own shots in such mines. Competent shotfirers should be employed to inspect, charge and tamp each hole and fire all shots after the men have left the mine. Shotfirers should be authorized to condemn and refuse to fire any shots that, in their opinion, are unsafe.

Ques.—State how you would proceed to rescue the men in a certain district in a mine, if a fire was to take place in an intake airway.

Ans.—The question should state whether much, if any, gas is generated in the district, and the position of the intake airway where the fire has started. Notify the men at once and bring them out by the best possible route. Short-circuit the air so as to prevent the smoke and gases of the fire entering the district, or reduce the circulation of air passing over the fire, which will have much the same effect. At the same time, start to fight the fire from the intake side by laying pipe lines or using any means available for that purpose.

Every mine should have a good rescue corps, equipped with apparatus that will enable them to do efficient work on such occasions. If gas is generated in considerable quantity in the district, the order should be given to extinguish all lights at once, except the safety lamps carried by the firebosses, who should take charge of the men and direct their escape.

[Next week's issue of *Coal Age* will contain a number of questions asked in this examination that have no place in testing the mining qualifications of men.—Editor.]

Coal and Coke News

Washington, D. C.

More advances in coal rates have been permitted by the Interstate Commerce Commission in line with the general advance in freight rates for which all the railroads of the country have petitioned. The Commission issued the following notice:

"The Commission voted not to suspend tariffs naming increased rates on bituminous coal from mines in Pennsylvania, West Virginia, Ohio and other states to Lake Erie ports for transshipment by vessel which will become effective Apr. 15 and later dates.

Applications for suspension of local rates on bituminous coal from the mines to Buffalo, N. Y., and Buffalo rate points are still pending."

Western and Southern railroads have joined with the eastern carriers in petitioning the Interstate Commerce Commission for a percentage advance in freight rates. The western roads indicated their desire for the moment for authority merely to file a suppemental statement naming a particular percentage advance without reissuing all of their tariffs. The southern roads, however, like the eastern roads singled out coal and coke for special treatment, and indicated their intention of asking for an advance of 15 per cent. in other rates.

The southern advance would apply to all traffic in the territory south of the Ohio and Potomac Rivers and east of the Mississippi. The southern roads stated they desire an advance of 15 per cent. on coal and coke with a maximum of 15 cents per ton.

The petition, which was signed by the presidents or receivers of 30 railways and steamship companies, represented "that by reason of large increases in the wages of employees and in the prices of fuel and other materials and supplies, coupled with which is the prospect of further increases, an emergency has been created which requires that those carriers be promptly afforded, by advance in their freight transportation charges, an increase of earnings, which will serve to offset in whole or in part these extraordinary additions to their operating expenses and furnish some protection to their efficiency and credit."

It was stated that the advance "will be essential to the accomplishment of the result indicated," but it was explained that it will not be practicable to advance all rates as much as 15 per cent. and that the carriers will not under the authority sought obtain an increase of this amount in their gross freight revenue.

It was stated to be the intention "as soon as practicable after the advance is made, to revise the tariffs so as to substantially continue and maintain the various relative or differential adjustments now in effect with respect to the Ohio and Mississippi River cities, Nashville, Tenn., Gulf ports, eastern and Virginia cities and south Atlantic ports, on the one hand, and the territory south of the Ohio River and east of the Mississippi River, on the other, and the roads desired that authority be given to make the advance upon short notice, without strictly observing any rules respecting the publication of tariffs which may conflict with the plan above outlined, and with whatever relief from observance of the prohibitions of the fourth section of the act to regulate commerce may be requisite."

Coal Is Reported Scarce

Many industries are being hampered by a scarcity of coal, according to reports reaching the Geological Survey. In the Pennsylvania and West Virginia districts the transportation situation continues to be the determining factor in the matter of coal supply. Since the settlement of the railroad strike, no concessions have been made in prices, it is declared, but the extreme fluctuations that marked the period just preceding the threatened strike have been supplanted by steadier quotations.

Labor troubles have decreased during the past month. Coke production is increasing slightly but the opinion is that there will be a shortage of coke for some time.

From Pennsylvania, Ohio and Kentucky come reports that the producers are entirely unable to secure adequate labor to meet their needs. Overtures have been made for the entire output of many mines at advanced prices. In some instances, contracts have been made and in others refused, either on account of conditions or in the hope of making better arrangements, or as is most noticeable in the Pennsylvania fields, producers have felt the necessity and the desirability of maintaining a percentage of output as free coal.

From the Birmingham district, reports indicate that the growing scarcity of labor is seriously threatening to cause marked decreases in the output. The exodus of negroes to northern manufacturing centers apparently is increasing. One large Illinois mining company reports that cars are being secured with much less delay.

HARRISBURG, PENN.

Asserting that the bill to regulate the hours of employees of power plants would force the employment of many additional men, coal operators, heads of public service and industrial companies bitterly opposed the bill at a hearing given by Chairman Ganns of the House Committee on Public Health and Sanitation on Apr. 3.

They argued that the bill is not designed "to protect the public health, but only to regulate the hours of employment of a certain class of labor." The protests of the employers set forth that the limitation would force "one-man plants" to employ additional engineers and firemen and work hardships to small employers.

It is predicted that the bill will be held in committee by Chairman Ganns.

A department of workmen's compensation distinct from the jurisdiction of any other state department is provided for in a bill presented by Representative Stern of Philadelphia. The Stern bill would have a board of three commissioners at an annual salary of $10,000 each, named by the governor for a term of 10 years. The first board of commissioners would be named, respectively for 8, 9 and 10 years, as of July 1, 1917. The Chairman is to be designated by the governor, and his remuneration is to be $500 additional per year.

No drastic changes are made in the practical application of the compensation act.

The amendments to the compensation act containing the labor unions proposed amendments have been favorably recommended by the House Committe on Labor and Industry. The labor men have been lobbying hard to get support for their amendments to the present law during the last fortnight but without much success. The bill may get to third reading in the House, when the representatives of the employers forcast defeat.

In the House a bitter fight is expected on the Buckman bill increasing the state police force by 102 men, making the aggregate 3322 and increasing the salary of the men. The fight was precipitated in the house this week, between representatives of the labor unions and employers, when the bill was on second reading.

It is predicated that the bill will pass the house, as more than half of the members from the coal districts will vote for it, whereas in the past they have always voted against the state police. They argue that the tide has turned in favor of the state constabulary, and that the United Mine Workers' argument is weak in asking them to vote against the bill, pointing out that the labor leaders themselves have called on this body of police to protect their organization from the I. W. W.

Considerable attention has been attracted among members of the House by a bill presented to establish a system of health insurance in Pennsylvania. It contemplates state participation and was prepared after four years' investigation and study under the direction of the American Association for labor legislation coöperating with the American Medical Association and representatives of labor and industry.

The bill provides compensation for losses due to sickness to all manual workers and all others earning less than $100 per month. It covers any sickness or accident not within the scope of the workmen's compensation act. Benefits include medical, surgical and nursing attendance, medical and surgical supplies; maternity benefits for childbirth; cash benefits for a maximum of 26 weeks in a year, and a limited funeral benefit. The state is to assume one-fifth of the cost of insurance; two-fifths is to be paid by the employers and the remaining two-thirds by employees. Local mutual health funds are created for the administration of these benefits and are to be under the joint control of the employers and insured employees.

PENNSYLVANIA

Anthracite

Olyphant—Fire in the boiler room at No. 2 shaft of the Delaware & Hudson Co. on Apr. 2, caused several thousand dollars loss and put the place out of operation. The origin of the fire is unknown.

Pittston—With the Susquehanna River receding after the spring freshet, preparations are being made for the resumption of coal-dredging operations on an extensive scale. A new concern with a fleet of four dredges will enter the business, while the Citizens Illuminating Co. has built another large dredge. The electric company last year removed close to 100 tons a day from the river bed. The coal deposits are particularly heavy just north of here where the culm and coal-laden waters of the Lackawanna enter the Susquehanna.

Gilberton—The Philadelphia & Reading Coal and Iron Co. will install new electric pumping equipment for handling local water and sewerage work. By this means it is planned to reclaim considerable property for miners' homes.

Hazleton—Alex. Patterson, on Apr. 5, filed the report of the miners' examining board No. 3 with President Judge Fuller, of Luzerne county. The board which conducts the examination in this district, held regular sessions during the period from Apr. 29, 1916, to Mar. 31, 1917. During that time 425 men who appeared for examination were granted certificates and 197 were rejected as not qualified. During the same period eight miners removed from other districts and holding certificates were registered with the local board in accordance with the mining law covering that feature of the work.

Browntown—Several homes were wrecked and the main roadway of the town caved in on Apr. 5. The cave extended entirely across the street to a depth of about 40 ft. The water main burst and the continuous flow of water and loud rumbling of the caving earth caused people to run in all directions for fear they would be engulfed. It is said the subsidence is due to taking out the pillars in No. 4 shaft of the Pennsylvania Coal Co.

Bituminous

Greensburg—Seger Bros., coal operators, have purchased 266 acres of coal in Derry Township. The consideration was $320,214. The field will be opened in the near future.

Washington—The Pittsburgh Coal Co. has purchased the coal underlying the 500-acre farm of the Myers Brothers near Washington for $330 per acre. This tract adjoins the 4000 acres which was purchased by the same company a week ago. This is one of the largest deals in Washington County coal recently.

Indiana—The second explosion within a year in the Robindale shaft at Robindale, Indiana County, of the Conemaugh Smokeless Coal Co. occurred recently, and resulted in the death of three men. The mine had been taken over by the new owners, the E. F. Saxman Co. of Philadelphia the day the explosion occurred. The three men who were killed were the only persons in the mine as the shifts were just changing and more would have lost their lives had they been in the mine. The cause of the explosion is thought to have been an accumulation of gas which was ignited from an electric spark from the trolley wire. The mine is said to be a complete wreck on the interior.

Almost 50 candidates presented themselves at the City Hall recently at the mine foremen's examination which was conducted by the examining board of the 25th bituminous district which comprises almost all of Indiana County. Thomas S. Lowther, inspector, is chairman, William, B. Wardrop, secretary and J. R. Balls, miners' representative.

Connellsville—According to the verdict reached by the coroner's jury which inquired into the explosion in the Isabelle mine of the Hecla Coal and Coke Company which resulted in the death of four men, the cause of the explosion has not been determined. The opinion of the state mine inspectors was that a body of gas was allowed to accumulate and was ignited from a spark from a trolley wire. The Inspectors also censured the mine officials, mine foremen and fire bosses for neglect in performing their duties.

The estimated coke production for the week ending Mar. 31 is placed at about 369,000 tons, of which furnace ovens produced 231,920 tons, and merchant ovens 137,870 tons. Rail shipments amounted to 365,556 tons, while 3000 tons were shipped by river.

Uniontown—Coal and coke operators of Fayette County were represented on Apr. 3, at the annual session of the license court and asked to have an order issued to abolish the sale of liquor at the coal and coke plants through agents of the distilleries. They did not oppose granting of licenses, however.

Heilwood—Williams & Griffith are now shipping coal from the new Grisemore mine near here. It is located on the Cambria & Indiana R.R. The Penn-Mary Coal Co. is now opening its No. 11 mine adjoining the Grisemore property and a new town will be built at this point.

Boswell—The Standard Quemahoning Coal Co. which operates several mines in this vicinity will open two new mines at Thomas Mills, this coun-

ty. Work is well underway and the plans call for a 1000 ton a day mine. The company will build houses for the men at Thomas Mills.

Waynesburg—The Buckeye Coal Co., a subsidiary of the Youngstown Sheet and Tube Co., has purchased 273 acres of coal land in Cumberland township from R. Loyd, Eli G., and R. L. Baily. The price is said to be $515 per acre. It has also acquired smaller adjoining tracks from T. P. Warne, Frank Ewart and others.

More sales in Richhill Township along the proposed new railroad have been recorded here. E. E. Morris of Waynesburg has bought 164 acres of Pittsburgh vein coal. William S. Hughes and William Hughes have sold 428 acres of their coal lands at Bristoria in Richhill Township for $125 per acre.

WEST VIRGINIA

Bluefield—A fire in the store of the Pocahontas Consolidated Collieries Co., at Lick Branch, recently wrought damage estimated at approximately $30,000. It is believed that the fire had its origin in defective electric wiring.

Beury—Much property damage aside from interference with traffic was recently caused by water liberated from an abandoned mine. The railroad bed was washed away in places for 100 yd., and rails and ties carried away. The mine at Echo was practically full of water, which was liberated by a shot of explosive. The whole volume of the water contained in the mine covering 8 or 9 acres was thus let loose suddenly.

Clarksburg—Opening of undeveloped coal tracts in order to supply fuel to the steel, iron, and other factories, is assuming a large part in the preparedness plans of West Virginians. The international situation has accelerated the laying of sidings to virgin properties, and the increase in capacity is apparently limited only by the amount of steel that can be secured on short notice; also the car supply. Among the new projects in the northern part of the state is a survey for a railroad up Finches' Run in Marion County, probably to reach a large acreage held by the Federal Coal and Coke Co. Shipments would be made over the Baltimore & Ohio R.R.

It is stated authoritatively that many operators in the Clarksburg and Fairmont mining sections have decided to make no contracts for coal during the current year, but to dispose of their entire output on the open market, in view of the steadily rising tendency of prices and the difficulty experienced during the past season in maintaining deliveries to customers. Large consumers continue to press for contracts, but the operators believe that it is better business from their standpoint to adopt the policy indicated.

Charleston—Little if any more coal was mined in West Virginia in the first three months of 1917 than was produced during the first quarter of the previous year, in spite of the opening of many new mines and the reopening of a number of abandoned operations. This is attributed in large measure to an acute car shortage. Thus, for the six weeks ending Mar. 23, on account of a poor car supply on the Chesapeake & Ohio, the tons actually hauled from the mines on that road amounted to only 490,590, while it is estimated that the total output would have been 1,328,940 had the operators received an adequate supply of cars.

Fairmont—The Morgan mine, three miles from this city, recently developed a fire, believed to have had its origin in electrical troubles. This fire is not of serious extent, being confined to about 200 ft. of coal face far back in the workings. All men have, however, been withdrawn from the mine, except those who were fighting the flames. The affected section has been bratticed off, and efforts will be made to smother the fire. The mine, however, will close down indefinitely. The miners thus thrown out of work will have no trouble in finding other employment at other plants in the vicinity which need men badly.

ALABAMA

Mulga—Thousands of acres of coal land in the southwestern part of the county, from Mulga to the Warrior River have been purchased through the Alabama State Land Co. by the Tennessee Coal, Iron and Railroad Co. Approximately $370,000 has changed hands in this transaction. The property purchased will add to the already extensive holdings of the Tennessee company, and evinces the need of the big corporations for additional property for development. Ultimately this property will be the basis for bigger production of coal which the corporation is anticipating.

KENTUCKY

Whitesburg—The South East Coal Co. has granted a 9-hour day instead of a 10-hour day in its plants at LaViers and Seco. Carpenters and mechanics are given an increase of 10 per cent.

So far the declaration of war has little affected mining plants in this section of the eastern Kentucky field—all are running on uninterruptedly. The car situation remains about the same, with the most of the operators getting all the cars they can load. Practically all plants are operating full time with both day and night shifts.

Frankfort—After a hearing of representatives of the Kentucky coal operators the House Committee on Revenue and Taxation decided to report the various bills referred to it relating to taxes on coal, oil and natural gas produced in the state without recommendation. One bill provides for a tonnage tax of 1c. on coal, another for a 2c. tax and still a third for a 5c. tax.

Fleming—The Elk Horn By-Products Co. at Parsons has awarded contracts for the erection of an additional 50 miners' houses, the work to be rushed as rapidly as possible.

The Acme By-Product Coal Co. immedaitely below the Neon yards is rushing work on a commissary building and 50 miners' houses on the Bentley coal land tract recently leased. It plans starting mining work within a few days, and hopes to be able to make first shipments of coal within 30 days.

Hazard—A survey of the Lott's Creek branch of the Louisville & Nashville R.R. to reach a rich undeveloped coal field has just been made, and it is said a contract for the construction of the branch will be awarded at once and the work begun. The road from 8 to 10 miles long will be completed and put into operation before the end of the year. This is one of the most inviting coal areas yet undeveloped in the Perry County field. A large number of operations will be started along the branch road.

OHIO

Steubenville—It is said that the Wayne Coal Co. is prepared to take over 4800 acres of farm land in Knox and Island Creek townships during the current month as part of the acreage planned for its gigantic coal stripping activity. It is said also that an immense additional acreage is now under option, and that plans are now being made to operate it upon a scale never before attempted anywhere in the world.

St. Clairsville—Stripping operations in this vicinity bid fair to reach a large volume during 1917, as equipment has been secured by several concerns which will give a large capacity. A Cleveland company is the latest to enter this field, having secured 4000 acres of land, part of which will be mined in the usual way and part stripped.

INDIANA

Boonville—One miner was killed and seven badly burned in an explosion of gas in the mine of the Erie Canal Coal Co., west of here, on Apr. 3. William Dean, mine superintendent, ascribes the cause to falling slate. John McKain, fireboss, inspected the mine shortly before and stated that he found no gas. These two went to the rescue of the victims. A hundred men are employed in the mine which is owned by Dr. T. D. Scales and W. F. Weyerbacher, of Boonville.

ILLINOIS

Belleville—The Superior mine here has been sold for the second time within 60 days. Edward Yoch has turned it over, for $68,000, to John Henderson of the West Virginia Coal Co. of St. Louis. Mr. Yoch bought it for $50,000, operated it about a month, and cleared about $10,000, it is understood.

Auburn—Miss Frances Wetmore, representing the National American Association is conducting classes here and at Thayer and Virden, for the purpose of spreading Americanism among the foreigners of the mining communities. Her schools are the first of the kind in America. Both men and women are taught the intelligent use of the vote. The women are taught sewing and home economics.

Harrisburg—The Saline County Coal Co. will install additional machinery and make extensive improvements at Mine No. 3, west of here, and at Mine No. 6, at Grayson. The work will be carried on without interfering with the operation of the mines.

ARKANSAS

Scranton—Work on the switch leading to the coal mines of the Subiaco Coal Co. near here is progressing rapidly, and J. P. Hoy, manager of the company, reports that the mines will be put in operation in a short time. Several other companies have leased coal lands in the Subiaco district and a number of new mines will be opened in that section. Machinery for the Subiaco mines has been purchased and will be delivered and installed as soon as the switch track to the mines is completed. It is predicted that the Subiaco district will become the largest coal producing section of Arkansas.

OKLAHOMA

McCurtain—The McCurtain Coke Co. has been reorganized here for the purpose of reopening the coke ovens that have been idle for the last 10 years. There are 200 beehive ovens here and the plant when it resumes operation will employ between 250 and 300 men. From 200 to 300 tons of coal will be coked daily and the plant will have an output of about 6000 tons of coke monthly. Coal burned in the ovens will be brought from the San Bois Coal Co., which operates mines at McCurtain. The ovens were built about 12 years ago, but were operated but a short time. The reorganized company has a capital of $25,000 and the incorporators are: R. D. Martin, El Reno; W. O. Martin, El Reno, and O. M. Miller, Fort Smith, Ark. The McCurtain coke ovens were originally built by Henry C. Frick, of Pittsburgh, at a cost of more than a quarter of a million dollars, but after being operated for about three years, were discontinued because their operation at that time was found unprofitable.

FOREIGN NEWS

Nanaimo, B. C.—Beginning with May 1 the Western Fuel Co. will adopt the system of paying its men twice per month instead of monthly. This decision was reached after a conference between representatives of the men and officials of the company, and it is believed will result advantageously for all concerned.

Calgary, Alta.—It has been asserted by James White, assistant to the chairman of the Conservation Commission, that with the United States at war, it will become obligatory for western Canada to increase its output of coal. This is for the reason that but little coal will move from the United States to Canada. Most of this increased production of coal should take place in western Canada, where there are many coal properties capable of producing a greater output if labor can be secured.

Personals

John W. Odlin has assumed the duties of advertising manager of the Wright Wire Co., of Worcester, Mass.

John Quinn has succeeded Robert Henderson as manager of the No. 4 mine, Comox colliery, Cumberland, Vancouver Island, B. C.

Thomas C. Wright, mine inspector of St. Clair County, Ill., for the past 7 years, has announced that he will not be a candidate for reappointment.

Letson Balliet, efficiency expert and consulting engineer, recently announced that until further notice he would receive his mail and telegraphic communications at Tonopah, Nev.

W. J. Murray was recently elected chairman of the Executive Committee of the Victor-American Fuel Co. G. F. Bartlett was also elected president and C. C. Dieter treasurer.

P. L. Baird has resigned his position with the Pocahontas Consolidated Collieries Co. as civil and mining engineer, and accepted one with the Pocahontas Fuel Co. at Norfolk, Va.

Robert B. Dick, formerly superintendent for the Rochester & Pittsburgh Coal and Iron Co., has accepted a position as superintendent of the Davis mines of the Davis Coal and Coke Co. at Thomas, W. Va.

W. M. Haver, formerly assistant superintendent of the Pittsburgh division of the Baltimore & Ohio R.R., has been promoted to the superintendency of the Wheeling division with headquarters at Wheeling, W. Va.

Robert P. Maloney, has been promoted from general superintendent to vice president and general manager of the Davis Coal and Coke Co. Mr. Maloney will move his offices and residence from Thomas W. Va. to Cumberland, Md.

Porter Kinneburg, mine foreman for the Tide Coal Mining Co. at Tidesdale, Indiana County, Penn., has resigned that position to accept a similar postion with the Rochester & Pittsburgh Coal and Iron Co. at the Lucerne mines, near Indiana, Penn.

R. Thomas Kirk, chief electrician for the Federal Coal Co., at Straight Creek, Ky. has severed his connection with that company in order to join the forces of the Cumberland Valley Fuel and Mining Co., as superintendent at Molus, Ky.

W. J. Wolstenholme has resigned as managing director of the Western Fuel Co. in order that he may devote his entire attention to his metal-mining interests. He is secretary and treasurer of the New Tuscarora Mining Co., and has important interests near Marysvale, Utah.

W. C. Reynolds, of Connellsville, Penn., general manager of the W. Harry Brown mining and coking interests in Fayette and Greene counties has tendered his resignation. His retiring from active duty has been caused by ill health and a desire to seek a little rest after more than 30 years of service.

Robert Ruse, of Brownsville, Penn., recently had a narrow escape from death. While working on the tipple of the H. C. Frick Coke Co.'s Bridgeport plant at South Brownsville he lost his hold and fell 75 ft. to the ground. He was removed to the Brownsville general hospital where

it was found that his only injury was a badly cut and bruised back.

Angus Brown, assistant superintendent of the Pratt coal mine division of the Tennessee Coal, Iron and Railroad Co., was reecntly promoted to the superintendency of Bayview mine of the same company. He succeeds Thomas G. Fear, who resigned to accept the position of general superintendent of coal mines in western Pennsylvania for the Inland Steel Co.

Frank Bevan has been made "foreman of mine cave repair work" of the Delaware, Lackawanna & Western coal department. The Lackawanna company has always done more or less of this work, and now it intends to systematize the work. Mr. Bevan has a large gang of men under him. Wherever the mining of pillars results in surface subsidence, the company will repair the damage at once.

S. L. Chamberline of New York, recently elected president of the Hocking Valley Products Co., to succeed Daniel E. Reagan has come to Columbus to assume his new duties. He will remain only temporary as he will continue to live in New York. Robert Taylor, Jr., of Baltimore is to be resident manager. Arthur P. De Vinnish will remain as sales manager of the coal department of the company.

H. H. Sanderson, mine safety engineer, of Seattle, Washington, has been asked to take charge of arrangements for the First Aid and Mine Rescue competitions at Fernie, British Columbia at the local coal-miners' May Day celebration on May 1. There will also be a competition, open only to miners, for the First Aid silver cup offered by the B. C. Department of Mines for annual competition in East Kootenay district.

Duncan McDonald, in leaving the office of secretary-treasurer of the United Mine Workers of Illinois, which he has held for 7 years, turned over to his successor, Walter Nesbit of Belleville, $1,519,395.22, the largest amount ever in the treasury of the organization at one time. McDonald has taken a position with the Co-Operative League of America and will be engaged in organizing coöperative stores. Nesbit has named Peter Zinc of Belleville as his assistant, to succeed Edward Wick of Staunton.

Thomas Graham, chief inspector of mines for British Columbia, recently tendered his resignation to the Minister of Mines and requested to be relieved from duty without delay. He has accepted the position of general superintendent at the Canadian Collieries (Dunsmuir), Limited. Arrangements were accordingly made so that he might enter the service of that company at once. Mr. Graham has been chief inspector since Jan. 1, 1912, prior to which date he was general superintendent for the Western Fuel Co., with headquarters at Nanaimo.

J. M. Savage, of Victoria, B. C., has been appointed general manager for the Canadian Collieries (Dunsmuir), Ltd., with head office in that city. Some years ago Mr. Savage was associated with John Arbuthnot, of Winnipeg, Manitoba, in the organization and operation on Vancouver Island, B. C., of the South Wellington Coal Mines, Ltd., afterward reorganized as the Pacific Coast Coal Mines, Ltd. The Canadian Collieries is operating several coal mines at its Extension colliery, with washery and shipping docks at Ladysmith, Vancouver Island, and other mines at its Comox colliery, Cumberland district, Vancouver Island, with coke ovens, coal washery, shipping docks, etc., at Union Bay.

Obituary

Thomas D. Jones, aged 75 years, a prominent independent coal operator, died recently, at the family home in Hazleton, Penn., after a long illness. Mr, Jones was born in South Wales, and came to this country in 1850, taking up his residence at Nesquehoning, where he was reared and educated, and started his mining career. From 1869 to 1872 he served as mining engineer with the Lehigh Coal and Navigation Co. and from the latter date to 1875 as general superintendent of the collieries of the same company. In 1875 he was appointed a state mine inspector. In 1881, he was appointed for a second term but resigned after a short time to take charge of the Ebervale Coal Co. He continued with this company until 1886, when he became associated with the Mill Creek Coal Co. as manager and owner. Mr. Jones is survived by his widow and two children, J. Elmer and Mrs. Alvan Markle, Jr.

Industrial News

Huntington, W. Va.—The elevator and coal dock of the Chesapeake & Ohio Railway Co. at Handley, W. Va., was recently destroyed by fire, the origin of which is unknown. The loss is placed at $15,000, of which $10,000 is covered by insurance.

Fairmont, W. Va.—The Empire coal tract in Monongalia County, composed of about 12,000 acres, is to be divided into 400-acre lots and put on the leasing basis. It is said that the leasing of this coal, which is among the best in the country, will be handled from a local office.

Columbus, Ohio—Because it represents that the Royal Collieries Co., Toledo, failed to deliver 20,000 tons of coal at $1.25 a ton during March, 1916, as per contract, the Middle West Coal Co., of Cincinnati, filed suit in the Federal court here to compel the former concern to pay $17,-248.32.

Jumonville, Penn.—One of the most destructive forest fires in the history of Fayette County started on Apr. 1, and despite the efforts of 60 trained fire fighters, made considerable headway, destroying much valuable timber used by coal mines. The damage already is estimated close to $100,000.

Huntington, W. Va.—The Chesapeake & Ohio coal loading is now nearly normal as is evidenced by the report recently made of coal-loading statistics for the month of March. A comparative statement of the various months is as follows: March, 1916, 2,500,520 tons; March, 1917, 2,244,565 tons; February, 1917, 1,921,685 tons. It is stated that the low figures for last month were due to car shortage, embargoes and other causes.

Charleston, W. Va.—The Keeney's Creek Collieries Co., operating at Winona, has sold its holdings to the Maryland Coal and Coke Co., which has also closed negotiations by which it has purchased the mines at Bachman, of the New River Valley Collieries Co. M. L. Garbey has been placed in charge of both operations as general manager.

Wheeling, W. Va.—The Lake trade is scheduled to open Apr. 15, and it is believed that eastern Ohio and northern West Virginia mines will then get in practically full time. Promises of plenty of railroad cars are made, and it is understood that the several railroads, will make special efforts to haul coal to the various docks.

Bluefield, W. Va.—Although seriously hampered by car shortage and congestion, the Norfolk & Western Ry. during the month of February, hauled 2,204,170 tons, according to the monthly statement. This is a decrease of 593,-986 tons, as compared with the previous month, and 350,206 tons below the tonnage of February last year.

Washington, D. C.—The idea of Van H. Manning, director of the Bureau of Mines, for a large central coal yard in the District of Columbia in which is to be stored an ample reserve of this fuel for Government use has advanced to the point of its being introduced into Congress. The bill making this provision was introduced by Representative Foster, chairman of the committee on Mines and Mining.

Columbus, Ohio—Because of a reduction of the salary of the position of chief deputy and safety commissioner of the Ohio Mining department from $3500 to $3000 it is a difficult task for the Ohio Industrial Commission to get a man to fill the vacancy caused by the resignation of James H. Pritchard. Mr. Pritchard is still holding on as well as discharging the duties of commissioner of the Southern Ohio Coal Exchange.

Cleveland, Ohio—City officials of Cleveland are considering the advisability of city ownership of a coal mine. The three-cent car fare and three-cent electric lights are handicapped by the high cost of coal. Commissioner of Light Davis urges the city to buy a large mine and operate an electric-light and power plant at the mine for the use of Cleveland. It is urged that other Northern Ohio cities join with Cleveland and thus have a central power plant.

Whitesburg, Ky.—The Blue Diamond Coal Co. operating on First Creek in Perry County is awarding contracts for doubling the present output—this to be done sometime during the coming summer. It will double the tipple equipment by extending it across Whiteoak Branch and opening mines on the farther side. It has also acquired additional holdings. This will make the Blue Diamond one of the largest operating companies in the Perry County field.

Philadelphia, Penn.—An order for 2000 freight and coal cars, costing approximately $3,600,000 was awarded on Apr. 4, by the Philadelphia & Reading Railway Co. This order brings the total value of equipment contracts placed since January 1 to about $6,500,000. The contract calls for 1000 box cars, each of 85,000-lb. capacity and 1000 gondolas of 100,000-lb. capacity. The order was apportioned as follows: Five hundred box cars each to the American Car and Foundry Co., and the Pullman Co., and 500 gondolas each to the Standard Steel Co. and the Pressed Steel Car Co.

Pittsburgh, Penn.—For the first time in history a western steel company has entered the coal field of Allegheny County for fuel. The Inland Steel Co., of Chicago has purchased 2000 acres of Freeport coal land from the Indianola Coal Co., of Pittsburgh for $2,000,000. The property, situated just south of Dorseyville, in the Allegheny Valley, has not been worked for about 12 years. Two shafts are already sunk. It is the intention of the Inland company to enlarge and concrete these at once. A daily production of 5000 tons is figured on. The coal is to be used exclusively for byproduuct purposes at the Chicago mills.

Chicago, Ill.—The most important coal property transaction ever recorded in southern Illinois is the deal now going through for the possession of mines in Franklin County that produce about 15,000 tons per day. It is admitted that the Purity mines Nos. 1 and 2 at Christopher have been disposed of and an undenied rumor has it that with these two mines will go the two largest mines in the high-grade Illinois field—Nos. 8 and 9 of the Old Ben Mining Corp. at West Frankfort. There are other reports which are neither admitted nor denied of other mines at Christopher and at one other point in the same county that are lined up for a transfer in the near future. It is supposed that the Cassett interests of the Pennsylvania System are the direct parties. They have been, it is understood, closely associated with the Morgan interests in looking after supplies for the Allies. This gives color to the prevailing report that the output of these mines will go to France and Italy. In the last two weeks about 25,000 tons a day of coal from this field has been contracted for, taking that amount from the commercial and domestic market.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

of Coal Age, published weekly at New York, N. Y., for Apr. 7, 1917.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Chester W. Dibble, who, having been duly sworn according to law, deposes and says that he is the Assistant General Manager of the McGraw-Hill Publishing Co., Inc., Publishers of Coal Age and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor ani business manager are:

Publisher, McGraw-Hill Publishing Company, Inc., 10th Ave. at 36th St., New York, N. Y.
Editor, Floyd W. Parsons; 10th Ave. at 36th St., New York, N. Y.
Managing Editor; Floyd W. Parsons, 10th Ave. at 36th St., New York, N. Y.
Business Manager, Joseph E. Sample, 10th Ave. at 36th St., New York, N. Y.

2. That the owners are:

McGraw-Hill Publishing Company, Inc., 10th Ave. at 36th St., New York, N. Y.
Owners of 1% or more of stock Issued.
James H. McGraw, 239 W. 239 W. 39th St., New York, N. Y.
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Fred S. Weatherby, 1600 Beacon St., Brookline, Mass.

3. That the known bondholders, mortgages and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages or other securities are: Bondholders, James H. McGraw, Arthur J. Baldwin, Henry W. Blake, Imogene Whittlesey, Hugh M. Wilson, Fred R. Low, Fred S. Weatherby, John McGhie, G. Eugene Sly, Estate of John A. Hill.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him. CHESTER W. DIBBLE,
Assistant General Manager, McGraw-Hill Publishing Co., Inc.

Sworn to and subscribed before me, this 31st day of March, 1917.

[Seal.] PHILLIP S. HILL.
(My commission expires Mar. 30, 1918.)

Market Department

GENERAL REVIEW

Heavy demand for anthracite at the opening figures and individuals already quoting the winter circular. Bituminous much unsettled and the general tendency is to mark time pending further developments. Rail congestion still an important factor. Car restrictions create a mixed situation in the Middle West.

Anthracite—The sales agencies have been completely swamped with orders, the rush at the opening of the week attaining to almost panic proportions, and any doubt that an enormous tonnage will be stored this spring, if available, has been definitely removed. War conditions have also now become a factor, and in view of the violent fluctuations to which the market is subject, it is likely to be only a question of time before governmental regulation of some sort makes its appearance. The public has not yet learned the seriousness of the situation, and is not in the market to any extent, but the retail interests are buying aggressively. It is becoming obvious that only the most favored customers will get much coal at the spring discount, and that very little headway will be made in filling the big gaps in their bins. Operating interests are crowding production as much as possible, but the outputs have been rather light, due to holidays. Buyers as a rule hesitate very little over prices, and most individuals are already quoting the full winter circular. At Down East points the retail interests are much alarmed at the slowness with which the season opens, and have grave doubts as to where they will get their winter's supply.

Bituminous—The Eastern bituminous trade is much exercised as to what part it will play in war. It is expected that a certain tonnage will be required to bunker allied patrol vessels on the Atlantic seaboard, while there were unauthenticated rumors the early part of the current week that the Government was asking for prices on a million and a quarter tons for prompt delivery. Should the Government commandeer much of the coastwise shipping, this will prove a serious factor to the New England trade, which is largely dependent on Southern coal, because of the rail congestion. In spite of the fact that stocks are at a very low point, there is very little attempt to accumulate reserves. The situation is very confused, and the general tendency is to mark time, pending developments that will give both buyers and sellers some assurance as to the future. A decrease in the bunker and export trade has released some much-needed coal for use in other directions. The market is in a distinctly waiting mood, and lacking the customary snap.

Lake Trade—The market is much upset by labor shortages and transportation difficulties, largely in the nature of embargoes. The poor showing of the railroads at this time is causing much anxiety as to what the result will be when the heavy Lake movement gets under way. As a result of the recent decline in prices, consumers have apparently come to the conclusion that the bottom has not been reached and are, accordingly, withholding buying. The market is very unsettled and the trade is awaiting developments with more than ordinary interest. It is impossible to accumulate any appreciable reserves, and with the present labor shortage showing indications of becoming more pronounced, the outlook for good shipments is not encouraging. There is already some demand for Lake coal, which has tended to stiffen prices, and some operators will soon be concentrating all of their production on this business. The producing interests continue very stiff in their views as to new contracts.

Middle West—Car restrictions and embargoes are creating a spotty situation. Some markets have been cut off from shipments and prices in those sections are very stiff, but the surplus tonnage thus created have been diverted into other markets, resulting in excessive supplies in those directions and consequent softening in prices. Numerous orders from outside markets are also becoming a factor in the Middle Western situation. The calling out of the National Guard has already been felt in labor circles, while the operating interests are viewing with considerable alarm the possibility of further heavy drafts of troops. Outside of some railroad contracts, business of this character is rather slow, it being the general rule for producers to continue shipments on their old contracts at prices in accordance with the different market conditions at the time of shipment.

A Year Ago—Definite relapse in the anthracite market and companies go on short working schedule. Bituminous continues irregular. Movement under way to the Lakes, but the opening of navigation much delayed. Middle West notably easier and output heavily curtailed.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week:

Boston	Year Ago	Apr. 14	Apr. 7	Mar. 31
Clearfields	†$1.50@1.95	$4.75@5.50	$4.50@5.25	$4.00@4.25
Cambrias and Somersets	1.60@2.10	5.15@5.75	4.90@5.50	4.90@5.50
Pocah. and New River[1]	2.75@2.85	6.00@6.50	5.75@6.00	5.50@6.00
Philadelphia				
Georges Creek (Big Vein)	1.90@2.00	5.00@5.25	5.25@5.50	5.75@6.00
W. Va. Freeport	1.30@1.35	4.50@4.75	4.75@5.00	4.75@5.00
Fairmont Gas mine-run	1.35@1.45	4.50@4.75	4.50@4.75	5.00@5.25
Pittsburgh (steam coal)[2]				
Mine-run	1.15@1.25	3.25@3.50	3.25@3.50	3.50@3.75
¾-in	1.25@1.40	3.25@3.50	3.25@3.50	3.50@3.75
Slack	1.10@1.15	3.25@3.50	3.25@3.50	3.45@3.55
Chicago (Williamson and Franklin Co.)[2]				
Lump	* 1.30@1.45	3.00@3.25	3.50@3.75	3.75@4.00
Mine-run	† 1.20@1.30	2.75@3.00	2.95@3.05	3.00@3.25
Screenings	.90@1.00	2.75@3.00	2.95@3.05	2.75@3.00
Gross average[3]	$1.45@1.61	$4.01@4.35	$4.07@4.36	$4.20@4.44

Gross Averages		
Dec.	2	$4.71@5.17
Dec.	9	4.69@5.15
Dec.	16	4.48@4.90
Dec.	23	4.67@5.08
Dec.	30	4.73@5.19
1917		
Jan.	6	5.16@5.53
Jan.	13	4.74@5.11
Jan.	20	4.54@4.98
Jan.	27	4.64@5.03
Feb.	3	4.66@4.86
Feb.	10	4.70@4.95
Feb.	17	4.67@5.04
Feb.	24	4.95@5.29
Mar.	3	5.10@5.48
Mar.	10	5.36@5.61
Mar.	17	4.80@5.19
Mar.	24	4.64@4.94

[1] F. o. b. Norfolk and Newport News. [2] Per net ton. [3] The highest average price made last year was $4.80@5.33 made on Nov. 25. * Price lower than the week before. † Price higher than the previous week.

BUSINESS OPINIONS

Iron Age—Higher prices for pig iron and finished steel, greater scarcity of labor, and hence further wage advances, increased demand upon all steel and metal-working capacity to fill enormous orders of the Government—all are indicated by the developments of the first week of the war. The steel trade, to begin with, has to deal with 300,000 tons of Government orders for navy and other shipyard work. As much more for like work will be placed later. That the prices arranged—2.90c. for plates and 2.50c. for bars and structural shapes—are less a hardship for the Steel Corporation than for any other manufacturer goes without saying. How this low-priced tonnage will now be distributed is yet to be worked out. The committee of manufacturers presumably will take account of the wide differences in costs in assigning Government steel.

Bradstreet—Conservatism mingles with activity in trade circles, the latter characteristic heavily outweighing the former, and while it is too early to accurately gauge the full effects upon business of the country's passing from peace to war, initial indications suggest that the transition is being accomplished with a minimum of unsettlement. Here and there credits have been restricted, and in a few instances buying for distant delivery has been curtailed, but looming high above such manifestations is the fact that business already booked is heavy, that governmental buying has stimulated numerous lines, that prices, particularly of foods and cotton, have soared, and that industries essential to war are being mobilized to take care of the country's needs.

Dun—With the formal recognition of a state of war generally discounted, business proceeds without semblance of disturbance, though with appreciation of the economic changes that must inevitably follow. Additional stimulus to industrial activity is foreshadowed by present and prospective government requirements, and for some time preparations have been under way to effect the necessary readjustments in both production and prices. Commercial failures this week are 241, against 279 last week, 294 the preceding week and 342 the corresponding week last year.

Dry Goods Economist—The governmental developments of the week, culminating in the declaration by Congress of war with Germany, have affected the various dry goods branches in different ways. The conservative policy pursued of late by mills producing cotton fabrics and woolen goods has been accentuated. Realizing the possibility of still higher prices for raw materials and feeling that their facilities may have to be placed at the command of the government, the officers of leading plants have instructed their selling agents or commission houses to accept no orders for future delivery until further notice.

Marshall Field & Co.—Wholesale distribution of dry goods continues to exceed the large volume of a year ago. Road sales for immediate delivery are about equal to the same week last year, while road sales for future delivery are considerably ahead of the corresponding period of 1916. Customers have been into the market in smaller numbers than for the same week last year.

CONTRACT PRICES

Philadelphia—On the recent request for bids on 375,000 to 500,000 tons of steam coal by the City Government, the Reading company submitted the following prices: Buckwheat, $2.50; rice, $2; boiler, $1.80; barley, $1.50. All of the bids on this contract ranged about $1 higher except on rice coal, the next highest figure on which was $2.13. The big anthracite companies are consistently refusing to contract on steam coal. Contracting on bituminous is progressing very slowly, producing interests becoming steadily more cautious. Current figures rule at $3.50 to $4.50, as compared with $3.25 to $3.75, and none of the shippers are anxious to close. Effective Apr. 10, the Pennsylvania Coal and Coke Corporation has announced that the price of bunker coal will be $5 per gross ton f.o.b piers, which is an increase of 25c. per ton, while an additional extra 25c. covering handling charge will be made. The tendency on contract prices is distinctly up with operators becoming more and more reserved about taking business of this nature.

New York—As a result of the extraordinary high prices on bids for city business, the city authorities are seriously considering substituting oil for coal in some of the departments. The excessive coal prices have already made it necessary to file an application to issue special bonds involving something over $300,000 for the purchase of coal for the Department of Docks and Ferries, and it is likely that similar applications will be made for other departments. The Central Purchasing Committee will ask for proposals on 280,443 gross tons of anthracite for delivery during the next 11 months. This is the largest single proposal ever asked for by the city, and the bids will be called for between Apr. 25 and 30.

Buffalo—In response to the request for bids for furnishing the city water-works with 60,000 tons of bituminous three-quarter or mine-run during the next 12 months, the Valley Camp Coal Co., of Cleveland, bid $4.72 per net ton delivered, and the Frick Coal Co., of Buffalo, $5.88. The contract last year went to the Valley Camp Coal Co. at $2.22. Only two bids were received on this business this year.

Cleveland—Contracts aggregating 500,000 tons of Pittsburgh No. 8 coal have been closed at prices ranging from $2.50 to $3 per net tone f.o.b. mine. A railroad contract involving 500,000 tons of mine-run per year for five years has been closed at $1.50 per net ton f.o.b. mine, based on the current mining scale.

Chicago—The Chicago, Burlintgon & Quincy Ry. is understood to have covered contracts with different mines aggregating 8000 tons of coal per day. Activity in contracting is confined largely to railroad business. Operators are continuing shipments on old contracts, with prices fixed at those effective at the time of shipment.

St. Louis—A large volume of railroad coal from the Standard field has been covered at prices ranging from $1.15 for mine-run to $1.30 for lump. Standard coals are showing a weakening tendency, but Williamson and Franklin County prices are being cancelled and higher ones quoted. The entire output of the Pana Coal Co.'s No. 1 mine for the next 12 months has been contracted to the Chicago & Eastern Illinois R.R.

Atlantic Seaboard

BOSTON

Government war preparations make commercial purchases more difficult at Hampton Roads. Very little Pocahontas and New River offering either spot or for contract. Pennsylvania grades firmer for the most part. Anthracite buyers increasingly anxious over the outlook. Rates on water coal very uncertain, and demand all-rail incerases steadily.

Bituminous—The effect of war upon current supplies at Hampton Roads is still largely a matter of conjecture, beyond the fact that Government requisitions will be largely increased. Whether allied ships will remain on patrol and put into Hampton Roads for fuel will also have some bearing on the volume of coal available for commercial shipments. The authorities are relied upon not to curtail coastwise movement any more than seems absolutely necessary because it is pointed out that the railroads will hardly be able to make deliveries all-rail in sufficient volume to keep this territory supplied as it will have to be supplied in order to keep in full operation the textile and other plants now working on Government orders.

A large number of low-priced and otherwise exacting contracts expired Apr. 1 and most of the shippers feel the tension somewhat relaxed. Such factors have been more conservative about estimates of output on their renewals, and barring enormous requisitions for the Navy there will probably be more coal for the spot market providing labor conditions remain about the same in the Southern fields. Probably, however, spot quotations will be on a higher level. Meanwhile there is increasing anxiety among buyers along the coast who are dependent upon marine transportation in the open market. Stocks to the eastward are very low and the strange thing is that aside from railroads and a few large mills apparently very little effort is being made to get coal forward. It is as if the trade were dazed. Many buyers are temporizing by taking small cargoes out of New York in the hope they can tide over until Hampton Roads prices are modified. Yet from their standpoint there are no present signs of improvement.

A few large consumers who postponed purchases of more than a small proportion of their supply early in the year have given up waiting for the Hampton Roads situation to "clear" and are turning to Pennsylvania operators for coal all-rail. The number of such buyers is small, however, and the tonnage does not run into high figures. There is bound to be anxiety, however, over the ability of the railroads to deal with the increased traffic. Should it come to the movement of troops and supplies other than coal, there would be a dubious outlook for New England. Stringent embargoes are already in effect against certain of the roads.

For inland distribution there is very little Pocahontas and New River open to the market. Distributors are those relying upon steamers and with the anxiety over the possible use of their ships for Government purposes it is natural that deliveries should be confined almost exclusively to contracts. Prices are still on the basis of $11 f.o.b. Boston or Providence.

High rates of insurance are already being charged, so high that charter terms may have to be considerably revised and the extra cost doubtless passed along to the consumer, even in cases where coal was sold on a delivered basis.

The demand for Pennsylvania steam grades continues strong. Any fair grade coal commands a high price, the sellers' figure usually being accepted if satisfactory assurance can be given that the coal will be shipped with reasonable promptness. The higher grades are pretty well sold up and operators dare not obligate themselves for more than the present rate of output will warrant. The outcome of mine workers' conferences seems to be a new wage scale to be put in force within a fortnight. According to the terms under which most sales have been made this year the advance will be passed along to the buyer.

Far-sighted operators are now adding to the "blue ribbons" already attached to sales memoranda a provision for legislation that may ensue whereby the Government may impose taxes upon coal leaving the mines for commercial use.

Prices have again taken an upward trend. Inferior coals are selling this week from 25@50c. higher than a week ago. When buyers try to arrange for cargoes from New York or Philadelphia they find themselves obliged to pay very handsome prices to assemble the coal. The chances of delay and heavy demurrage both on boats and on coal are enough to discourage the ordinary purchaser.

Bituminous at wholesale is quoted about as follows, f.o.b. loading ports at points designated, per gross ton:

	Clearfields	Camb. and Somersets
Philadelphia	$6.00@6.75	$6.40@7.00
New York	6.25@7.00	6.65@7.25
F. o. b. mines	4.75@5.50	5.15@5.75
Alongside Boston (water coal)	8.75@9.25	9.00@9.50

Pocahontas and New River are quoted at $6@$6.50 f.o.b. Norfolk and Newport News, Va., for spot coal, and $11 on cars Boston or Providence for inland delivery.

Anthracite—Unfavorable weather has much delayed shipments. Dealers are more than disappointed over the slowness with which the new season starts. The dull spot near the end of March quickly disappeared, and now with all the complications buyers are at a loss which way to turn. A very few of the companies are now shipping to this market by water, and already the precautions are such that movement is bound to be very slow. An increased demand from Tidewater dealers for deliveries all-rail is already making itself felt. Shipments this way were just beginning to be quite favorable when embargoes were placed.

Meanwhile the public is making efforts to get retailers to commit themselves on season's supply. All over New England dealers are being overrun with orders for spot delivery. Salem, Mass., is the only place heard from up to this writing where retail prices have been reduced. Dealers are in no position to make prices for more coal than they have on hand, for no assurance whatever can be had from the producing companies as to future quotations.

NEW YORK

Premiums obtained for domestic coals by individuals. The companies well supplied with orders and are not accepting new customers. Quotations for smaller sizes vary but sales are few. Bituminous situation stronger with good prices. Fair grades plentiful.

Anthracite—With only half the month gone individual operators and shippers are quoting egg, stove and chestnut coals at full winter circular or 50c. more than the company's circular for April. Most mines are working as nearly full time as possible but the demand is greater than the supply. There has been a couple of idle days due to the Easter Church days, but otherwise most of the mines have been working steadily. As it is nearly all of the large producers have sufficient orders booked to carry them well into the next month, and are refusing to take on new customers.

Shippers of individual coals dispose of their supplies readily and at good premiums. The demand at the New York Tidewater far exceeds the supply and the wholesale offices are visited by many buyers who hesitate little over quotations when assured of quick deliveries. All quotations are given, however, subject to prior sale.

All companies are following the lead of the Reading company in announcing a discount of 50c. on the winter circular for egg, stove and chestnut coal. No formal announcement has been made regarding broken coal but it is understood that it is being quoted at $4.95 at the lower ports and that it will increase in price 10c. per month for five months, putting it on the same basis as egg. Egg coal is the shortest of the three prepared sizes and when taken alone brings better prices than either stove or chestnut. Red ash chestnut was quoted at 60c. above the white ash coals.

The quotations for pea, buckwheat No. 1, rice and barley vary with all shippers with one or two exceptions. There is a heavy demand but supplies are short and there is none in stock. The large producers show no intention of making contracts and the big office buildings and large consumers are not able to provide for their supply for this year.

There was some free boiler coal offered at $3 alongside the early part of the week which was soon picked up.

The high prices for coal recently received by the New York City officials in response to advertisements for bids has caused an investigation to be made into the question of substituting oil. Whether or not the substitution in several of the city departments will be made will depend largely upon the bids to be received by the Central Purchase Committee between Apr. 25 and 30. These proposals will call for bids for furnishing and delivering 280,443 gross tons of anthracite and bituminous coal, 11 months requirements for 14 departments.

The tonnages required will be: Broken, 1245 tons; egg, 11,481 tons; stove, 6556 tons; chestnut, 1111 tons; pea, 15,716 tons; buckwheat No. 1, 29,335 tons; buckwheat No. 2, 87,700 tons; buckwheat No. 3, 102,222 tons; bituminous, 124,610 tons, and gas coal, 367 tons.

This will be the largest proposal ever asked for at one time by the city. Bids for one month's supply for several of the departments included in the above proposal were opened last month. The tonnage involved amounted to nearly 5000 tons.

The existing prices have already caused application to be made for the issuance of special revenue bonds for $316,492.40 for the purchase of 56,000 tons of buckwheat No. 2 for the Department of Docks and Ferries. It is likely that similar requests will have to be made in behalf of several other departments.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	$4.95	.....
Egg	4.95	$5.20@5.45
Stove	5.20	5.45@5.70
Nut	5.25	5.50@5.75
Pea	3.60@4.10	4.75@5.00
Buck	3.70@3.80	4.50@4.75
Rice	3.00@3.30	3.95@4.20
Barley	2.50@2.80	2.95@3.20
Boiler	2.20	2.20@2.50

Quotations at the upper ports are generally 5c. higher for domestic coals on account of the difference in freight rates.

Bituminous—The market quickly recovered from last week's slump and prices are again strong. Demand is heavy for the better grades and there is a good supply of the fair grades for the spot coal buyers. The high grade coals are quickly absorbed on contracts.

Shippers are not forcing sales at this time pending the outcome of the strike negotiations in the central Pennsylvania fields, where the miners have given the operators until Apr. 17, to either grant or refuse their demands. The western Pennsylvania region operators also have labor troubles pending which may result in a suspension of mining.

There was a good all-around call for supplies early this week which caused a stiffening of prices. Operations were slow, the miners remaining away on Good Friday and then again on Easter Monday. In addition there were several mines closed down on account of labor troubles. The employees of one large company have been granted an advance of 10 per cent.

The railroads have not contracted for all their supply and are making good offers but not meeting with much success. Operators show no desire of tying up their output in contracts believing they will be able to secure better prices later on. Contracting has practically ended, operators refusing to enter into long time agreements under existing conditions and uncertainties.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	Port Reading	South Amboy	Mine Price
George Crk.			
Big Vein	$6.75@7.00	$6.75@7.00	$4.50@4.75
Tyson	6.50@6.75	6.50@6.75	4.25@4.50
Clearfield	6.25@6.50	6.50@6.75	4.25@4.50
South Frk	.....	7.00@7.50	5.50@5.75
Nanty Glo	.....	6.75@7.00	5.00@5.25
Som'r. Co	6.50@6.75	6.50@6.75	4.25@4.50
Que'ho'ing	6.75@7.00	6.75@7.00	4.75@5.00
W. V. Fa'rm't			
Th'r'qua	6.25@6.50	.....	4.25@4.50
Mine-run	6.25@6.50	.....	4.00@4.25
West. Md.	6.25@6.50	6.25@6.50	3.75@4.00

PHILADELPHIA

Anthracite shippers overwhelmed with orders. Heavy demand for pea at varying prices, contracts at $3.50. Shipments light on account of holidays. Retail demand quiet, and price cutters active. Bituminous fluctuates. Gas coals increase in price. Slack continues in extraordinary demand.

Anthracite—All shippers are overwhelmed with orders; no sooner had the mining companies cleared their books of the accumulation of winter orders, sold at the old circular, than they were again choked up with business. There is not the least doubt that an enormous tonnage will be stored this spring if it can be had, not only locally but in all sections of the country. In the beginning of the present week the rush to have orders booked almost resembled a panic. Dealers here have not hesitated to place orders far beyond their requirements and even their ability to handle if it were all shipped.

Wholesale prices continue to cause much uneasiness, and while all companies have during the past ten days accepted orders on egg, stove and nut at 50c. off the winter circular, there is no telling what day these may change, since the country has entered the war. While the four big companies are charging the same prices on the above sizes, there are only two of them who agree on pea, the Lehigh Valley Coal Sales and the Susquehanna Coal Co. quoting $2.50 in this market, and it was even rumored that the former company had lately advanced their figure to $2.75. The P. & R. Coal and Iron Co. with its $2.30 rate is making no pretence to fill its requisitions for this size. The Lehigh Coal and Navigation Co. did not announce its price of $3 until the afternoon of Apr. 3, but within a few days, notwithstanding the advance of 50c. over the price of the larger company, it had more business than it can hope to fill for a month.

The fact that the leaders in the trade did not announce the same figures on pea and the smaller sizes is still causing much comment and wonder is expressed as to whether later in the season their differences will extend to the larger sizes. The individuals who opened the season with prices ranging from $2.60 to $2.80 were quick to follow the higher prices and advanced to $3, with at least 50c. per ton above to outside points. As a matter of fact a number of the individuals were known to be seeking contracts covering the entire year at the $3.50 price and the business came so fast that they

have declined to take any more orders for this size at all.

The dealers are finding that a heavy tonnage of this size has been sold not only by the smaller shippers but even the very largest on contract at $3.50 so they naturally do not hesitate to order at $3. The question now arises how near in price can this size come to the larger sizes without causing an appreciable advance in the prepared coals. In view of the experiences of the past winter and the fact that the country is now at war it is reasonable to expect the most exciting times in the history of the trade. The question naturally arises, Just how far can prices go without the Government stepping in? While this has often been attempted in times of peace, we have a precedent in the sudden reforms which have been effected across the sea almost over night after the beginning of war.

With five holidays, including two Sundays, out of the first nine days of the month the early shipments have been greatly curtailed. It must be admitted, however, that the demand on the dealers was actually lighter than anticipated. This is due largely to the fact that the dealers have done very little soliciting because they had no idea what tonnage they could expect from their shippers. Neither have they any assurance that prices will only advance 10c. a ton on May 1. Naturally they hesitated in seeking large tonnages to be delivered at the April quotations until they could form some definite opinions as to what this market could expect from the shippers.

In the face of all these conditions the chronic price cutters have already renewed their activities. Notwithstanding they do not know where the coal is to come from they are advertising family coal at ridiculous prices. Most of them are offering pea coal at $5.25 as against $6 asked for by most conservative dealers and we even know of one dealer who offers pea at $5 a ton, though he has not had a pound of this size in his yard for two weeks. However, the price cutters are beginning to weaken and are intimating to their trade that it may be necessary to increase prices any day now without notice.

A feature of the week has been the announcement by all shippers concerned that they will cease to equalize freight rates. For years it has been the custom where the freight rates from different regions varied only five or ten cents a ton for the shippers to assume the difference by allowing the dealer to deduct it from the price of the coal.

All steam coal sales are being made at prices close to those quoted below, there being no contracts, although most of the coal reaching the market is being shipped to those customers who formerly held contracts with the large mining companies. As a consequence very little of this coal has been reaching new consumers, although the pressure is growing strong from all quarters and a willingness is indicated to pay higher prices even than those quoted.

The condition in the contract market is best reflected by the prices bid on supplying the city with from 375,000 to 500,000 tons of steam coal, which were re-advertised and opened on Apr. 5. On a previous occasion the P. & R. Coal and Iron Co., who usually obtain the bulk of this business refused to bid and the lowest figures were submitted by brokers. However, the Reading company this time submitted prices which are the same as they have been quoting their trade in general since Apr. 1. That is, $2.50 for buckwheat, $2 for rice $1.80 for boiler and $1.50 for barley. Other bidders were $1 higher than these prices, except on rice on which the next highest figure was $2.13. All the big companies continue to maintain their stand of not contracting on steam coal.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$4.50	$5.65	Buck	$2.50	$3.40
Egg	3.65	4.75	Rice	2.00	3.00
Stove	3.90	5.10	Boiler	1.80	2.90
Nut	4.00	5.05	Barley	1.50	1.75
Pea	2.80	3.70			

Bituminous—There has been much fluctuation recently both in the demand and prices. Owing to flood conditions in the Pittsburgh district which has hindered the movement and cut down production of coal from that territory there has been an unusually heavy demand for high volatile coals by the steel mills. This condition has had its reflex in the Fairmont fields and as a consequence prices on those grades have remained quite firm for the past two weeks. On the other grades marketed here there was a slight upward movement a few days since, but this has tapered off somewhat until prices at this writing are about 25c. less all around than last week although it is not thought any further reductions are likely for the time, while some interests are predicting increases on account of the war.

So far the war with Germany does not seem to have made any particular impress on the business, but there is no doubt that with the navy on active service a vast tonnage of coal will be required and the rumor is already abroad that the Government is asking for prices on a million and a quarter tons for quick delivery.

If anything the market has shown a lack of real snap, not that there is a dearth of inquiries for fuel, but the big buyers of spot coal seemed to have relaxed their efforts for a short period. The call for slack has in no wise diminished and most users of this coal have reached the conclusion that it will not be possible to procure the tonnages they require. As most of this coal is used in mechanical stokers many plants are putting in crushers and breaking the coal down at the boilers.

The miners in the western district continue to display signs of restlessness over the wage scale. As increases have been made recently in Ohio and Illinois they intimate that as much is now due them.

There have been greatly increased inquiries for contract coal recently, as everyone seems to have the desire to put by some fuel for stock, but the shippers continue to maintain the position that they have reached their contract limit. Of course there is always some contracting being done, but the prices on this have stiffened quite materially. Whereas a few weeks ago most of this business was being closed at $3.25@3.75 the figures now are $3.50@4.50, and with no shipper at all anxious to close.

The Pennsylvania Coal and Coke Corporation has given notice that after Apr. 10 bunker coal will be $5 per gross ton, f.o.b. piers. This is an increase of 25c. per ton and in addition there will be a wheeling charge of 25c. a ton. This price applies to the Port Richmond and Greenwich coal piers in this city and the Delaware coal piers at Wilmington, Del.

A fair volume of coal is reaching the city and there seems to be some increase in shipments of bunker fuel of late. The car supply has not improved any for the past month or more, and this week movement east of the Susquehanna River was hindered somewhat for a few days by an unusually heavy snow storm.

The prices per gross ton f.o.b. cars at mines are as follows:

Georges Creek Big Vein	$5.00@5.25
South Fork Miller Vein	5.00@5.25
Clearfield (ordinary)	4.75@5.00
Somerset (ordinary)	4.75@5.00
West Va., Freeport	4.50@4.75
Fairmont gas lump	4.75@5.00
Fairmont gas, mine-run	4.50@4.75
Fairmont gas, slack	4.25@4.50
Fairmont lump, ordinary	4.50@4.75
Fairmont mine-run	4.25@4.50
Fairmont slack	4.25@4.50

BALTIMORE

Anthracite situation much upset. Spring schedule held up. Spot market for bituminous firm, with but little contracting.

Anthracite—The local trade is so much in the air that the Baltimore Coal Exchange has failed to set a schedule, though a meeting shortly may fix some sort of a price list for the retail trade. Despite the announced schedule with a 50c. April cut on all but broken and buckwheat sizes by the largest producing company, such light deliveries are expected in April from this concern that little impression is made on the trade here.

Independents are quoting all sorts of schedules. Some offer 50c. off and then add a premium, while others are still quoting the old winter schedule on some sizes. On broken, which is used in many of the larger furnaces here, there has been a big change. Instead of the old winter rate, which made it 60c. less than the next size, it is now quoted by some independents at 50c. above the smaller coal. This is an increase of $1.10 a ton on this size, which will practically drive it from the market. Many concerns are not quoting prices on buckwheat at all to the trade here.

The upshot of the entire matter is that coal men are afraid to take orders or to make contracts. They are endeavoring to get all the lowest-priced coal they can through to fill the big gaps in their bins. Only favored customers will be given this coal at the low spring prices, if any at all is thus distributed. There would not be enough to go around at a 50c. cut, and there is the great uncertainty that a 10c. advance a month will be the rule, even where the reduction is granted. No dealer here is willing to be caught unprepared and the few orders accepted are subject to price revisions.

Bituminous—The soft-coal market remains steady, with light demand and receipts that just barely keep pace with same. The situation would be much more tense were it not for the fact that bunker and export business has undergone a great decrease. Coastwise business as well as trans-Atlantic sailing has suffered recently. Following the first rush of contract seekers around the first of April and the refusal of most coal firms to contract for lengthy periods, there has been a falling off in requests for contracts from consumers. There does not appear to be any great uneasiness among consumers, who are merely buying from hand to mouth. Spot prices here are but a little in excess of offerings at the mines, which is in sharp contrast to a few weks ago.

Prices to the trade at the mines are about as follows: Georges Creek Tyson, $4.50; Somerset, $4.25; Quemahoning, $4.25; Clearfield, $4; Freeport, $3.75 to $4; Fairmont gas, three-quarter, $4; run-of-mine, same, $4; slack, same, $3.75.

Advances have been announced here in the trimming charges on local bunker and tug-supply business. The increased freight rate on coals delivered here for outside the Capes, announced for Apr. 16, has ben postponed until July 16.

HAMPTON ROADS

Spot prices slightly easier. Receipts somewhat better. Shipments heavy. Navy taking large tonnage.

Owing to better movement and car supply spot prices at this writing are somewhat below last week's quotations. There is no prospect of any general reduction, however, and before the week is out there may be a sharp recovery. Shippers are speculating on possible Government action and a number of them are not accepting any new orders at any price.

Recent developments have created an unsettled condition in the trade and no one seems to be willing to accept any commitments for future delivery. All of the coal piers at Hampton Roads are under a heavy guard of soldiers. The principal source of supply for the Navy and the Panama Canal is Hampton Roads. Several shippers have experienced considerable trouble the past few days in reference to neutral vessels carrying coal cargoes foreign. All information concerning both foreign and U. S. shipping is rigidly withheld.

Current quotations for Pocahontas and New River run-of-mine for export and coastwise shipment are as follows: $5.50@6; for bunker delivery $6@6.25 plus 15c. trimming; for local delivery on track in carload lots $5 per net ton. Anthracite $9 per net ton delivered.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	Mar. 17	Mar. 24	Mar. 31	Apr. 7
Nor. & West	160,247	150,654	152,909	174,420
Ches. & Ohio	124,166	102,418	114,477	112,128
Virginian	84,747	89,038	96,084	80,457
Total	369,160	342,110	363,470	367,005

Ocean Shipping

COASTWISE FREIGHTS

No charters are reported from Hampton Roads to Boston; $4@4.25 continues the range, in the absence of any quotations to the contrary. The next rates named are certain to be higher. War-risk insurance at advancing rates is now a factor and this may soon reach a point where charters will be declined.

New York loading for Boston has stiffened to $2. The rate to Long Island Sound ports is about $1.25 for good dispatch; $3.25@3.50 has been paid to Eastern points.

OCEAN FREIGHTS

Freight rates to the Mediterranean and to South American ports are firmer than a week ago and a steamer is reported as having been chartered to load coal at Virginia for Buenos Aires or La Plata at $27.60. Rates to Cuba and to the Winward Islands are unchanged, and a number of steamers were chartered during the past week to take coal to Havana at or about $5 and to the Winward Islands at or about $10.

We would quote freight rates on coal by steamer as follows:

Europe	Apr. 2	Apr. 9
West Coast Italy	$60.00@66.00	$60.00@72.00
Marseilles	60.00@66.00	60.00@72.00
Spain (Atlantic)*	22.80@27.60	27.60 about
Spain (Mediterra'n)*	27.60	30.00 about
Note—Charters for Italy, France and Spain read; "Lay days to commence on steamer's arrival at or off port of discharge."		
South America		
Montevideo	26.40 about	$27.60 about
Buenos Aires	26.40 about	27.60 about
Rosario	27.60@28.80	28.80 about
Rio Janeiro	[3]21.00 about	[3]21.00 about
Santos	[3]22.00 about	[3]22.00 about
Chile (good port)	17.00@18.00	17.00@18.00
West Indies		
Havana	5.00 about	5.00 about
Cardenas, Sagua	7.00 about	6.00 about
Cienfuegos	7.50 about	7.25 about
Port au Spain	10.00 about	10.00 about
St. Lucia	10.00 about	10.00 about
St. Thomas	8.00@ 9.00	8.00@ 9.00
Barbados	10.00 about	10.00 about
Kingston	7.25 about	7.25 about
Curacao[1]	8.00 about	8.00 about
Santiago	7.25 about	7.25 about
Guantanamo	7.25 about	7.25 about
Bermuda	7.50 about	6.50 about
Mexico		
Vera Cruz	8.50@ 9.50	8.50@ 9.50
Tampico	8.50@ 9.50	8.50@ 9.50

* Spanish dues for account of cargo. [1] And p.c.
[2] Or other good Spanish port. [3] Net.
W. W. Battie & Co.'s Coal Trade Freight Report.

Lake Markets

PITTSBURGH

Labor supply very short. Embargoes cause fresh disturbance. Wages will advance.

The coal market entered the week in a completely upset condition. There was a great shortage of labor, owing to celebration of the Easter holiday, and while there was a fair supply of cars, doubtless equal to or in excess of the labor supply, there were numerous embargoes that made it difficult for producer and consumer to connect in such way as to establish a regular market. The Pennsylvania has embargoed all coal shipments for the Youngstown district, for instance, as well as shipments to Buffalo, and there are various other embargoes.

Coal operators are very much disappointed, as the improvement in traffic conditions previously had been so slow that it needed to be continuous to amount to much, and the present disturbances augur ill for conditions when the Lake season opens. The opening will be late on account of the ice having become particularly thick and the spring being a cool one, but it is due in considerably less than 30 days nevertheless.

Nothing definite is given out as to what the operators will propose to the miners against their demand for a large bonus in wages. The four states are working together and each state is to make a unit proposition. It is a foregone conclusion that some advantage will be offered the men over the present scale.

The spot market is not clearly determined, but can be quoted at the same range as a week ago, with the notation that there are some offerings at less, due to embargoes: Slack and steam mine-run, $3.25@3.50; ¾-in. gas, $3.75@4, per net ton at mine, Pittsburgh district. Operators are very stiff in their views as to contract, generally at $3.50 or higher, but buyers show little disposition to take hold.

BUFFALO

Buying is light, but cars are scarce and bituminous is firmer. Contracting slow. Anthracite beginning to go into Lake vessels. April prices stimulate buying.

Bituminous—Nobody buys coal now till the old supply is gone. There is so much in the air now that it is hard to see why the consumer holds off. Sellers are positive that the market is firming up and that the bottom figures have been reached for the present; they say that the chance of the Government taking over coal in large amounts is enough to account for market strength.

The car situation is not good. Just now the Pennsylvania R.R. is holding back cars from Buffalo and the Canadian situation is bad. Embargoes were laid on one road and the others were fairly swamped in consequence. If the demand was strong there would be much difficulty. A while ago the prices began to decline and the weakness was taken to mean a return to something like old figures and since that time it has been hard to get consumers to come into the market.

There has been comparatively little mining of late. The custom to lay off during Holy Week was kept to the full and there have been labor difficulties besides. This has met the slow buying and kept prices firm. A further adjustment will have to be made before it is known where the market will go. Jobbers and operators are confident that they can hold the market and see no reason for any further decline, such as the consumers are looking for. Consumption keeps up to the full and there was never so much need of coal as now.

Prices are not quite as unsteady as they were, but shippers seldom agree on them. Quotations are:

Youghiogheny Gas	$4.75@5.25
Pittsburgh Steam	4.25@4.75
Bessemer	3.75@4.25
Allegheny Valley	3.50@4.00
Ohio No. 8	3.25@3.75
Cambria Co. Smithing	4.25@4.75
Pennsylvania Smokeless	4.40@4.90
All Slack	3.15@3.65
Cannel	5.00@5.59

All per net ton, f.o.b. Buffalo.

The state of the contract market is well shown by the bids for furnishing the city water-works with 60,000 tons of bituminous, three-quarter or mine-run, for a year on which there were only two bids. The Valley Camp Coal Co. of Cleveland bid $4.72 per net ton delivered and the Frick Coal Co. of Buffalo, $5.88. The Valley Camp Co. had the contract last year at $2.22. Consumers are now more eager to make contracts than shippers. They have sent out requests to shippers for contract prices, which are to include a few sample cars at the prices quoted, thus making sure of quite an amount of coal at a considerably reduced price.

Anthracite—The demand is good and the supply increases, so that one shipper has begun to take tonnage for Lake shipment, though it is not likely that the upper-lake passages will be open for some weeks yet. There is no longer any complaint here of coal shortage and the Canadian situation is also improving. Still it will be sometime before the supply will be easy. The miners are not working very actively and the surplus is small.

The reports from upper-lake indicate that coal is urgently needed and it will be got under way as soon as the fleet moves, though nothing like the opening shipment of former seasons is possible now. Shipping agents are gratified that there is prospect of a liberal movement through the decline of the April price. If circulars had remained at winter figures the consumer would have held off and the fall would again see the whole year's supply still unsold and another possible winter like the last.

There is going to be a steady all-rail demand for anthracite. The cars are so scarce that it will not be easy to meet the demand anywhere. Besides the season continues cold and the actual consumption since Mar. 1 is much more than it usually is. There is no promise of warm weather just yet. Whether the consumers will buy all they can get now remains to be seen.

"Independent" coal that was quite freely offered a week ago at prices well down to the April circular has now been advanced 50@75c. Buyers generally are taking the attitude that coal is coal and will buy from any source offering.

Broken coal is now tentatively quoted at 50c. over the April price for egg. The indications are for a much smaller tonnage of this size proportionately.

DETROIT

Domestic consumption much diminished and there appears to be an over-supply arriving. Lake coal is slow to reach docks.

Bituminous—In the opinion of some of the local jobbers, producers are too liberal with their shipments to Detroit at this time. Some allowance should be made for the fact that the use of domestic coal is very greatly diminished. There is also less difficulty in getting shipments through from the mines, and in consequence it is reported the quantity of coal appearing for sale is greater than is desirable to maintain the market, and weakening prices are the outcome. Slack and lump or egg from West Virginia, Ohio or Kentucky is offered on a mine basis of $2.75, while for mine-run a quotation of about $2.25 is reported. Smokeless stock, probably due to large shipments to the Atlantic seaboard, is holding more firmly at around $3.75 to $4 at the mines for lump and egg.

Anthracite—Inquiry for anthracite is rapidly disappearing. Meantime some of the shipments ordered weeks ago and delayed in transit are being received. The retail yards seem to be carrying heavier stocks, and wholesalers are receiving few orders.

Lake Trade—To lack of sufficient car supply and motive power on some of the Southern roads is attributed the unsatisfactory movement of coal to loading wharves. Vessel owners are beginning to fear difficulty will be met with in obtaining a sufficient supply for loading the boats on their early trips and for providing fuel. One shipper has contracted for vessel capacity to move about 500,000 tons from Lake Erie to Milwaukee at a carrying charge of 50c. a ton.

COLUMBUS

Trade in a waiting mood, and contracting slow. Neither buyers nor sellers will fix prices. Demand holds up well.

The market has been rather quiet during the past week. International developments together with the Apr. 1 period have had the effect of lessening activities for the future and both operators and consumers are waiting to see just what will happen before going ahead. The demand for all grades continues good and prices are firm at the levels which ruled a week ago. Prospects for the future are for stiffening demand and higher quotations.

Steam business is now one of the most important phases of the trade. Manufacturing establishments are using a large tonnage and some of them are trying to accumulate a surplus by buying from the open market. Railroads are taking a large tonnage for the movement of trains. Contracting is extremely slow as neither producer nor consumer are anxious to enter into agreements under present unsettled conditions. Railroads are contracting to a certain extent. Some tonnage for Lake trade has also been contracted for. On the whole the market is very unsettled and coal men generally are waiting events with more than ordinary interest.

The domestic trade is slow as is usually the case at this time of the year. Dealers are now going slow as they are not anxious to stock up with a large amount of high-priced coal. They are buying only from hand to mouth as it were and waiting to see what the final level of prices will be. Retailers look for more stability after May 1. Rural dealers are buying better than those in the cities.

Production has been hampered both by the lack of cars and railroad congestion. As a result the output was not as large as in some previous weeks.

Preparations for an active Lake trade are going right along. Some coal is now being shipped both from the Hocking Valley and Pomeroy Bend districts to Lake ports for loading on vessels to move as soon as navigation opens. Many of the operators will devote their entire attention to the Lake trade when once it is started.

Prices on short tons f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$3.00	$3.00	.....
Inch and a quarter	3.00	2.75	$2.75
Three-quarter inch	2.75	2.75	2.75
Nut	2.75	2.75	2.75
Egg	2.25	2.50	.....
Mine run	2.25	2.50	2.50
Nut, pea and slack	2.50	2.50	2.50
Coarse slack	2.50	2.50	2.50

CLEVELAND

Car supply very irregular. Spot coal dull and weak, but contract market strong and active. Good demand for Lake coal.

A peculiar situation has prevailed in the Cleveland market the past few days. While very light shipments have been made from the mines to Cleveland since the first of April, a considerable tonnage of both domestic and steam coal has been coming in which was loaded at the mines from 10 to 30 days ago; in fact, some Pocahontas coal arrived which was loaded in January. This tonnage, while not very large, was still enough to bear the local market and prices declined considerable.

On the other hand, the car supply at the mines has been very irregular, and there being a good demand for coal for shipment to Lake ports, prices for direct shipments stiffened up, and at this writing are from 50c. to $1 higher than the prices received for spot coal.

The contract market has been very active and several contracts with manufacturing plants, totaling over 500,000 tons Pittsburg No. 8, have been closed at prices ranging from $2.50 to $3 net ton f.o.b. mine. One contract was closed with a steam railroad calling for 500,000 tons of mine-run per year for five years at $1.50 net ton f.o.b. mine, based on the present mining scale.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$3.00	$3.00	$3.00
Cambridge	3.00	3.00	3.00
Middle Dist.	3.00	3.00	3.00
Hocking	2.75	2.75	2.75
Pocahontas	....	4.00	....

CINCINNATI

Domestic demand has ceased, but steam consumption is heavy, and the supply limited. Cars and labor are scarce, and prices remain high.

While little fuel is moving for domestic purposes, the market remains strong and active on account of the demand from large steam consumers and from the retail trade as well. Retailers are practically a unit in warning their customers that prices will not drop materially, if at all, and in urging that coal be stored at once for next winter's use.

Steam consumption is at the same heavy rate, and as it has been impossible to accumulate any reserves this condition seems likely to continue. The slight improvement noted in the car situation still leaves the supply far from adequate. A serious shortage of labor is also threatened now, due to the continued industrial activity, the certainty of an increased need for farm labor and the withdrawal of men for army service.

BIRMINGHAM

Contract business good, with spot trade improved over a week ago. Prices continue stiff, with no sign of weakening. Car supply better.

Both contract and spot trade conditions show improvement over last week and the demand from both classes of consumers is good. Customers seeking to cover their requirements by contract are very active and are compelled to take the initiative in negotiations and practically meet the views of the producers as to prices. With a stiff spot market prevailing and indications pointing to a continuation of such conditions for some time to come, operators are showing an indifferent attitude toward contracting. Contract prices range from $2.50 to $3 per ton, mines, and a large tonnage was disposed of in deals involving from 2000 to 6000 tons. Spot prices on steam grades are as follows, per net ton, mines: Big Seam mine-run, $2.75@3; washed, $3@3.25; Carbon Hill mine-run, $2.75@3.25; Cahaba, Black Creek and Pratt, $3.25@3.50.

The domestic market has been brisk and retail dealers are active in providing for their needs. Some domestic mines have sold up through May. Aside from the fact that no reduction in prices can be expected, dealers are mindful of the probability of a more stringent car supply this fall than obtained last year and consequent difficulty in securing deliveries, and are closing contracts and beginning to stock coal.

As a whole, the car supply has been better the past week, though operators on the Southern and 'Frisco have lost some time on account of not getting sufficient equipment.

LOUISVILLE

All-round good demand characterizes the Kentucky fields. Prices hold firm. Some apprehension as to labor situation.

There are insistent demands on all sides, with the indications that retailers and industrial consumers are proposing to stock up as they can. The car-supply situation is unsatisfactory, although somewhat easier, but prospects are for capacity use of all equipment. Shortage of labor is causing some apprehension on the part of operators, who wonder whether any considerable impulse toward enlistment would leave them crippled worse than has been the case. Further increases in wages are effective, while it is observed that a strike movement or two will hardly develop any importance. Contracts are slow to be made and prices are ruling high.

Eastern Kentucky quotes block, $3@3.50; mine-run, $2.50@2.75; nut and slack, $2.25@2.50 or higher. Western Kentucky quotes lump around $2; mine-run around $1.50, and nut and slack, $1.50@1.65. All prices are f.o.b. the mines.

Although it is now the middle of April, contracts are being closed slowly, but it is predicted that the prospective situation for the next several months will have been diagnosed shortly and that contracts will be closed more easily. It appears that there is not much distinction being made as to the grades. Three dollars is almost the lowest price for eastern Kentucky, while very few contracts are to be reported from the western part of the state.

Coke

CONNELLSVILLE

Labor supply very short. Car supply moderate. Wages to advance. Contracting light.

The spot coke market was rather soft nearly all last week, but showed a slight stiffening on Saturday. This week has opened with no market clearly established as the situation has been much upset by conflicting influences. Car supplies on the whole are somewhat better, but the labor supply thus far has been very poor, the men having celebrated the Easter holiday to the limit. There was not enough labor Monday to take care of the car supply, even though it was well below the allotments.

Operators continue to show great reserve in the matter of quoting coke on contract, and consumers are somewhat reserved also. Operators foresee many troubles ahead relating to both car supply and labor supply. A general wage advance is expected in the Connellsville region, in connection with the Steel Corporation's announcement made last week that effective May 1 there would be a general advance for its employees of about 10 per cent., and in some quarters it is held that advancing wages will make the men still less disposed to put in full time. On the other hand it should serve to discourage the migration of men to other employments, something that occurs to an extent every spring. On foundry coke some operators are not quoting at all. Two at least are quoting $9 for second half, while there is a little to be picked up at $8.50, and those quoting $9 state they are simply waiting for that coke to be taken out of the situation. We quote: Spot furnace, $8; contract, nominal, $7@8.50; spot foundry, $10; contract, $8.50@9, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Mar. 31, at 369,790 tons, an increase of 1126 tons, and shipments at 365,556 tons, a decrease of 4757 tons.

Buffalo—The demand remains strong and the car supply unites with light production to keep prices firm. It is a situation that is hard for the consumer, for he neither wants to pay the present high prices nor to wait on a light supply for a possible decline. Connellsville shippers quote best foundry at $12.85 and furnace at $10.85 per net ton, f.o.b. Buffalo.

Chicago—Byproduct ovens continue to have difficulty in meeting demands on account of shortage in labor and car supply. No important change in the coke market is noticeable in this vicinity.

Birmingham—Coke continues to be very scarce and high-grade foundry is quoted at $15 ovens to spot trade. Inquiry is strong and the district cannot care for the business offered. Furnace coke is only available in small quantity and brings from $7.50 to $8 ovens.

Middle Western

GENERAL REVIEW

April prices firm on high-grade coals, slight reduction in lower grades of Illinois and Indiana coals.

As a result of the April circular quoting prices for April and May shipments, the mines in the southern district of Illinois have more business booked for shipment during the next three weeks than can be taken care of. This business is coming not only from the extreme Western territory but from the Northwest and the dock sections. Large orders have been placed by some of the dock companies to take care of current business, or until the opening of navigation. Most of this is for Franklin County coal.

Operators are accepting no contracts to speak of, except a few that have made contracts with the railroads. The Chicago, Burlington & Quincy Ry. has secured the entire output of a sufficient number of mines to insure them 8000 tons per day. However, it is understood they are willing to take on approximately one million tons for storage, and this amount does not seem available with present conditions. The Indiana mines report a slight slump in orders, but as car supply shows no improvement most of the mines are working 50% of capacity, which has been the average for the past two months. Car shortage seems to be growing, but with the shortage of men it is the belief the mines will operate not more than 50% of the time in the districts where 65% to 70% has been the rule the past winter.

CHICAGO

Slight decline in lower grades, higher grades firm, Eastern coal scarce.

The Chicago market continues in an unsettled state, and while plenty of steam contract business has been offered, the operators prefer to accept orders on basis of price effective at time of shipment. With 65% of the old contracts expiring Mar. 31, the trend is toward much higher average prices.

The Pana Coal Co. has sold the output of its mine No. 1 here to the Chicago & Eastern Illinois R.R. for one year on a mine-run basis. This means continuous night and day operation of the mine, employing 300 men.

Anthracite while showing a reduction of 50c. per ton, according to circulars, is coming through more slowly than ever. Premium prices will no doubt be offered prior to the end of the month. Prospects for Lake shipments to come through at an early date are very uncertain; in fact no one can foretell the approximate time, and no promises are being made by any of the Chicago jobbers as to deliveries.

The Franklin, Saline and Williamson County mines have received a large volume of orders as a result of the April circular which went into effect on the first of the month. Screenings and mine-run are firm at $2.75 to $3, with tendencies toward the higher figure. Car supply shows no improvement, and labor supply will be more serious in a few weeks than any time the past winter. Prices on sized coal, lump, furnace, small egg, stove and washed nut are $3 f.o.b. mines, or $4.05 f.o.b. Chicago. Screenings and mine-run have been purchased in large quantities.

Springfield district has been firmer due to poor car supply, and unsatisfied demand on the field to the south. Prices are: Lump, egg and No. 1 nut $2.50; mine-run and screenings $1.75.

In the Fulton and Peoria districts, most companies have issued circulars naming the following prices at mines: Lump or egg (domestic) $2.50; lump or egg (steam) $2.25; nut, $2.25. Increases are anticipated for the month of May.

The Indiana field has shown a slight reduction since the first.

Pocahontas continues scarce, the price f.o.b. Chicago ranging from $5.80 to $6.05 on lump and egg; $5.30 to $6.05 on mine-run. Very little of this coal is held in storage in Chicago, and retailers are asking customers to make arrangements to use other coals.

No Hocking is moving to this market due to fact that the buyers are not placing orders, the mines are not offering, and the transportation companies are not in position to haul it.

Splint coal is offered at $3.50 mines, or $5.40 Chicago. Demand in the West has fallen off on account of high prices, but east of Chicago business is above normal.

Eastern Kentucky has been offered in the Chicago market the past week at prices ranging from $3.50 to $4 f.o.b. mines on domestic lump and egg. Most of the companies are selling this coal from day to day, and have not issued circulars.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Springfield	Fulton & Peoria Cos.	Clinton & Sullivan Cos.	Green & Knox Cos.	Carterville
Domestic lump	$2.50@2.75	$2.75@3.00	$3.25@3.50	$3.25@3.50	$3.00@3.25
Steam lump	2.00@2.25	2.25@2.50	2.50@2.75	3.00@3.25	2.50@2.75
Egg	2.50@2.75	2.75@3.00	3.25@3.50	3.25@3.50	3.00@3.25
Nut	2.50@2.75	2.75@3.00	3.25@3.50	3.25@3.50	3.00@3.25
Mine-run	2.00@2.25	2.25@2.50	2.50@2.75	2.25@2.50	2.25@2.50
Screenings	2.00@2.25	2.00@2.25	2.00@2.25	2.00@2.25	2.00@2.25

	Williamson & Franklin Cos.	Saline & Harrisburg	Poca. & W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump	$3.00@3.25	$3.00@3.25	$3.75@4.00	4.00@4.50	$3.50@4.00
Egg	3.00@3.25	3.00@3.25	3.75@4.00	4.00@4.50	3.50@4.00
Nut	3.00@3.25	3.00@3.25	.....	.....	3.50@4.00
No. 1 nut	3.00@3.25	3.00@3.25	.....	.....	.....
No. 2 nut	3.00@3.25	3.00@3.25	.....	.....	.....
No. 3 nut	2.75@3.00	2.75@3.00	.....	.....	.....
No. 1 washed	3.00@3.25	.....	.....	.....	.....
No. 2 washed	3.00@3.25	.....	.....	.....	.....
Mine-run	2.75@3.00	2.75@3.00	3.25@4.00	4.00@4.25	3.00@4.00
Screenings	2.75@3.00	2.75@3.00	.....	.....	3.25@4.00

Hocking Lump $3.50@3.75. Splint Lump $3.50@4.00.

ST. LOUIS

Local market very easy though with a slight tendency to strengthen on high grade coals. Standard coal selling at about cost of production with a larger supply than demand. Big plants putting coal in storage. Car supply getting better. No prices on Eastern coals.

The domestic demand is practically gone except in isolated cases. There is a slight demand among the retailers for domestic coal in anticipation of higher prices in the summer and next fall. Many homes that usually have coal put in during the summer months are arranging for April and May delivery, but this is not general.

High-grade coal is extremely slow, both for steam and domestic. There is very little country demand and while a circular price of $3 is being maintained in Illinois and the Northwest, car restrictions and an overproduction are forcing lower prices in the local territory. Prices as low as $2.50 have been quoted throughout the territory on Iron Mountain shipments, and in a few other cases on other lines. Restricted shipments to St. Louis bring about $1.75@2 for lump, egg and nut, and the same for screenings. Coal that moves north to the Chicago market brings pretty near the circular. There is nothing to indicate that there will be any great demand outside of railroad for high grade during the present month.

In the Mount Olive field the mines are working in full, and the coal is moving to Chicago and the north at circular price. Very little of this coal is coming in to St. Louis at any price.

Standard coal is selling at prices below cost on account of restricted equipment and an overproduction. The railroads, however, are helping out in this field to the extent of perhaps 5000 to 8000 tons a day. However, there is considerable activity in this field, even with the low prices.

The retail circular for April delivery in St. Louis is per net ton: Williamson and Franklin County, $4.25@4.40; Mt. Olive, $3.75; Standard, $3.25. Anthracite chestnut, $10; egg and stove, $9.75; grate $9.50. Arkansas semi-anthracite mine-run, $7; grate $8. West Virginia smokeless egg and lump, $8.25; gas house coke, $10.75; byproduct, $12.

During the week there has been a large volume of railroad tonnage placed for shipment between now and July 1 at prices that varied from $1.15 for Standard mine-run to $1.30 for lump. Several big contracts are about to be closed.

In the Standard district the tendency on contract prices seem to be to weaken, while in the high grade Williamson and Franklin County field, old prices are being cancelled and higher ones quoted, though the majority of the operators are refusing to name any prices.

Up to the present there has been no anthracite prices quoted for the St. Louis territory, but prices are expected in next week. Something like 400 cars have been sold here, subject to the price at the time of shipment in April or May.

About 500 cars of smokeless have been bought for St. Louis at $4@4.50, depending upon time of shipment. The freight rate on this is $2.50.

The prevailing market in this territory is, per net ton f.o.b. mines:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump	$1.75@2.00	$1.75	$1.15@1.30
3x6-in. egg	1.75@2.00	1.75	1.15@1.30
2x3-in. nut	1.75@2.00	1.75	.95@1.15
No. 2 nut	1.75@2.00	.....	.95@1.15
No. 3 nut	2.00@2.25	.....	.....
No. 4 nut	2.00@2.25	.....	.....
No. 5 nut	1.90@2.00	.....	.....
2-in. screen.	1.90@2.15	1.75@2.00	.95@1.15
2-in. lump	.....	.....	.90@1.15
3-in. lump	.....	1.75	.....
Steam egg	1.75@2.00	1.75	.90@1.10
Mine run	1.50@1.75	1.50	.90@1.00
Washed			
No. 1	2.25	.....	.....
No. 2	2.25	.....	.....
No. 3	2.25	.....	.....
No. 4	2.25	.....	.....
No. 5	2.00	.....	.....

Rate on Williamson and Franklin County is 72½c. Rate on other fields is 57½c.

MILWAUKEE

Market at a standstill waiting developments. Anthracite prices announced. Bids on city business waited with interest.

The coal market, as far as wholesaling and jobbing is concerned, is at a complete standstill. Dealers are making every effort to keep former customers in a satisfied frame of mind, by supplying their wants in a reasonable way, forgetting the element of profit at times in so doing, but there are many sore spots which will have to be healed before the old order of things can be restored. All of which gives promise of lively competition when things break loose.

The advent of spring has brought about a change in the retail market, however, and the situation is easier. New supplies are only about a month away and consumers are less anxious, despite the fact that there has been little warm weather as yet. The accepted scale at present for anthracite varieties is as follows: Egg and stove sizes, $9.10 spouted and $9.45 carried; chestnut, $9.35 spouted and $9.70 carried; pea, $7.75 spouted and $8.10 carried; buckwheat, $7.25 spouted and $7.60 carried. These prices will undoubtedly obtain until the receipt of new supplies.

On Saturday, Apr. 14, the city will receive bids for the delivery of 3000 tons of Youghiogheny screenings, or 2000 tons of the same and 1000 tons of Pocahontas screenings for delivery at the rate of 60 tons per day by the fourth of June. There will be more than ordinary interest in the bidding because of the uncertain outlook as to supplies and prices.

KANSAS CITY

The arrival of spring weather, and the lessening in the demand for coal, have removed nearly all vestige of uneasiness in the public mind as to coal supplies. It is said that there is little inquiry over contracts, though two months ago large users were eager to get a line on the possible prices, and to close up. Car shortage continues.

General Statistics

BALTIMORE & OHIO R.R.

The following coal and coke tonnage was moved over the Baltimore & Ohio R.R. and affiliated lines during the months of January and February, 1916-17:

	January		February	
	1917	1916	1917	1916
Coal	2,814,321	2,703,264	2,361,350	2,666,007
Coke	290,986	382,692	203,766	378,461
Total	3,105,307	3,085,956	2,565,116	3,044,468

THE PENNSYLVANIA RAILROAD

The following is a statement of coal and coke carried on Pennsylvania Railroad Co.'s lines east of Pittsburgh and Erie for the month of February, 1917, in short tons:

		Decrease
Anthracite coal	878,870	92,710
Bituminous coal	3,706,963	494,230
Coke, short	807,478	322,125
Total	5,393,311	909,065

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for January, 1916-17, and for the 7 months ended January, 1915-16-17, in long tons:

IMPORTS	January		7 Months		
	1916	1917	1915	1916	1917
Anthracite, total	4,370	146	12,115	7,124	1,363
Bituminous, total	156,566	96,952	840,627	954,747	806,806
United Kingdom	1,728	913	21,112	5,359	1,437
Canada	148,069	94,639	639,686	819,966	733,314
Japan	4,550	.....	58,287	54,570	54,022
Australia	2,219	.....	120,219	74,041	16,423
Other countries	.....	1,400	1,323	811	1,610
Coke	6,289	1,490	73,191	33,077	17,592
EXPORTS					
Anthracite total	274,986	295,396	2,147,876	2,090,781	2,398,365
Canada	257,608	288,667	2,109,323	1,997,000	2,346,721
Argentina	.....	1,075	.....	1,931	1,610
Brazil	100	290	6	2,472	1,343
Uruguay	.....	.....	.....	600	.....
Other countries	17,278	5,364	38,547	88,778	48,691
Bituminous total	942,144	1,071,124	8,684,898	11,345,759	11,702,401
Italy	100,039	71,773	577,860	1,892,579	801,879
Canada	536,264	584,241	6,005,140	6,116,441	7,510,691
Panama	36,026	49,993	144,219	324,145	292,661
Mexico	23,099	15,647	252,138	118,511	101,797
Cuba	80,860	110,476	595,328	717,656	788,050
Other West Indies and Bermuda	46,109	70,737	253,390	358,735	285,360
Argentina	33,142	50,207	151,419	400,380	559,568
Brazil	31,401	53,127	201,483	334,548	459,602
Uruguay	8,159	.....	30,494	93,215	83,454
Other countries	47,045	64,923	473,427	989,549	819,339
Total coal	1,217,130	1,366,520	10,832,774	13,436,540	14,100,766
Coke	90,890	83,673	299,141	529,673	594,848
Bunker coal	570,461	629,682	3,949,914	4,400,302	4,738,785

ANTHRACITE SHIPMENTS

In the shipments of anthracite for March, 1917, the collieries of the region established a new record with a total so close to 7,000,000 tons that 250 more cars would have brought the shipments up to that figure. The total actually reached was 6,989,075 tons, an increase over February, 1917, of 1,810,643 tons, or 35 per cent., and over March, 1916, of 861,724 tons, or 14 per cent. The highest record previously made was in October, 1915, when 6,683,007 tons were shipped. This record was exceeded by the shipments for March by 306,068 tons. This maximum tonnage record for the region was made possible because of the fact that there were 27 working days—no general holidays—and there were fewer interruptions to steady work than usual by reason of button strikes and other labor difficulties. Railroad cars were also in better supply, as the congestion at terminal points was relieved and weather conditions were unusually favorable for March.

Shipments were as follows:

	March		Year	
	1917	1916	1917	1916
P. & R. Ry	1,374,051	1,237,378	3,490,923	3,418,425
L. V. R.R.	1,234,871	1,001,614	3,130,405	3,017,342
C. R.R. of N. J.	785,209	582,465	1,939,420	1,804,019
D. L. & W. R.R.	1,162,230	1,063,665	3,063,711	2,763,367
D. & H. Co.	728,857	490,453	1,878,530	1,726,737
Penna. R.R.	517,704	581,845	1,404,830	1,727,085
Erie R.R.	792,453	741,714	2,112,825	2,108,408
N. Y. O. & W. Ry.	185,496	152,958	493,882	513,874
L. & N. E. R.R.	323,157	275,259	833,122	628,750
	7,104,028	6,127,351	18,347,648	17,708,007
* Deduction	*114,953		*239,416	
	6,989,075		18,108,232	

* Deduction: Tonnage reported by both C. R.R. of N. J. and L. & N. E. R.R.

EXPORTS BY DISTRICTS

Exports of domestic coal and coke from the United States and bunker coal laden on vessels engaged in the foreign trade, at the specified districts, during the month of January, 1917, were as follows:

Districts	Anthracite	Bituminous	Coke
Maine and N. Hamp.	259	31	.....
Vermont	711	10,971	3,983
Massachusetts	156	30	.....
St. Lawrence	84,369	152,969	2,189
Rochester	2,978	45,186	1,345
Buffalo	193,424	232,769	33,746
New York	7,934	2,049	1,660
Philadelphia	2,290	57,026	333
Maryland	.....	53,093	.....
Virginia	.....	367,483	2,584
South Carolina	.....	2,863	.....
Mobile	.....	25	.....
New Orleans	22	933	17
Laredo	.....	2,432	1,540
El Paso	.....	2,643	2
Eagle Pass	.....	607	.....
Arizona	.....	3,526	16,515
So. California	1	52	35
San Francisco	2	.....	719
Washington	.....	2,520	4,766
Dakota	1,799	5,916	678
Duluth and Superior	1,400	6,684	194
Michigan	51	81,067	5,717
Ohio	.....	40,247	5,650
Total	295,396	1,071,124	83,673

BUNKER COAL

	Gross Tons
Maryland	33,886
New York	258,093
Philadelphia	34,645
Virginia	187,173

NORFOLK & WESTERN

The following is a statement of coal handled by the N. & W. Ry. during February and the preceding two monhts in short tons:

	December	January	February
Pocahontas	1,335,822	1,428,291	1,161,688
Tug River	290,411	324,236	277,597
Thacker	242,020	279,944	230,094
Kenova	84,782	89,595	66,388
Clinch Valley	133,762	162,687	118,450
Miscellaneous	11,618	21,273	9,179
Total N. & W.	2,098,415	2,306,026	1,869,396
Wlm. & Pond Ck.	112,447	124,030	110,530
Tug. R. & Ky. R.R.	48,653	55,312	49,138
Other roads	209,084	322,788	175,106
Grand total	2,468,599	2,808,156	2,204,170

THE CHESAPEAKE AND OHIO

Comparative statement of coal and coke traffic from New River, Kanawha and Kentucky districts for the month of February, 1917-16 and two months ending Feb. 28, in short tons:

To	February		Two Months	
	1917	1916	1917	1916
Tidewater	512,951	444,482	1,025,903	945,374
East	250,925	230,810	524,395	480,442
West	856,479	1,172,442	2,041,895	2,474,926
Company's Fuel	186,464	194,767	394,168	379,217
From Connections	115,147	160,360	283,825	349,539
Total	1,921,966	2,202,861	4,270,186	4,629,498
Anthracite	626	1,075	1,344	2,359
Total	1,922,592	2,203,936	4,271,530	4,631,857
Coke	40,297	41,352	87,657	87,873

The effects of the heavy rail congestion are evident in the heavy decline in the shipments for the two months' period.

I. C. C. Decisions

No. 8672. Traffic Bureau of Nashville vs. Louisville & Nashville R.R. Submitted Oct. 23, 1916. Decided Mar. 13, 1917.

Rate on coal from western Kentucky mines on the Louisville & Nashville R.R. to Nashville, Tenn., increased from 80 to 90c. per ton on Feb. 16, 1916, found not justified, and a rate of 80c. per ton prescribed as maximum for the future. Reparation awarded.

Foreign Markets

GREAT BRITAIN

Mar. 29—There has been no appreciable change in the situation since last report. Market is quietly steady, prices ruling at about last quotations.

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$6.00@6.24
Best dry coals	5.76@6.00
Best Monmouthshires	6.00@6.24
Seconds	5.52@5.76
Best Cardiff smalls	4.08@4.32
Cargo smalls	3.60@3.84

Freights—Tonnage is still none too plentiful, but some slight improvement in this direction has to be recorded; owing to grain restrictions in the Argentine, outward rates in that direction are likely to advance.

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Derry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Gibraltar	$19.20	Port Said	$26.40
Marseilles	21.00	Las Palmas	16.80
Genoa	24.30	St. Vincent	18.00
Naples	23.58	River Plate	24.00
Alexandria	27.00		